October 24, 2012

SECTION 5- SCOPE OF WORK

5-1.1. The project specifications and requirements were developed by Electrosonic Systems Inc. Design Consulting and include the following:

- Beverly Hills City Hall Upgrade Narrative - Pages 1 through 9
- Audio-Video-Control Systems General Specifications - Parts 1 through 6
- Beverly Hills City Hall Improvements Design Documents – Oct. 8, 2012
- Beverly Hills City Hall TV Production –AVC Equipment List Oct. 15, 2012

Beverly Hills City Hall

Television Production AVC Systems Upgrade

AVC Narrative

October 15th, 2012

The City of Beverly Hills requires audio, video and control upgrades to its Television Production System relating to the Council Chambers, Room A and Control Room. The general overall scope of work, to be detailed further on in this document is:

Council Chambers:
Replace/upgrade video distribution system from analog to digital.
Provide new digital video matrix
Replace/upgrade audio DSP system
Replace wireless and wired microphone systems
Replace/upgrade AMX control system, touch screens and programming
Replace/upgrade AV networking
A change to the existing SDI broadcast camera system is not in this scope.

Room A:
Remove current AV rack, projector and projection screen.
Provide new AV rack with digital video matrix, audio DSP, wireless microphone systems control system and networking.
Provide (4) new SDI/HD-SDI remote pan/tilt cameras (will require new AC power drops in ceiling)
Provide new LED-LCD wall monitors
Replace current ceiling speakers
Replace/upgrade AMX control touch screens and programming

Control Room:
Replace/upgrade analog audio console to digital
Provide new remote camera control unit for new Room A camera system
Provide new audio DSP head end processor
Provide new digital video matrix and connections into existing TV broadcast system
Replace/upgrade control touch screens and programming

Overall Project:
Provide: site meetings, engineered drawings, procurement, fabrication, installation (including low voltage and high voltage cable/conduit supply and install as required), test, commissioning, programming, training and warranty for a full turnkey deliverable to the City of Beverly Hills.

The AV systems in these rooms are currently functional. Some of the existing cabling shall be re-used for the upgrade – but this is mostly limited to the analog microphone audio and control cables. The upgrade project shall require some cables to be removed and replaced with new types. New cable runs shall also be required from the

Control Room to both the Council Chambers and Room A AV rack rooms. Most of the new cable run requirements are Gigabit CAT6A cables, and coaxial HD-SDI cables. The four new cameras and LCD screens in Room A shall require new power drops, AV contractor shall liaise with City Hall on the best way to achieve this, in terms of suitable existing breaker panel locations that can be used.

All new UTP & network cable runs shall be shielded CAT6A

- Recommended CAT6A type: Belden 10GX52F (or plenum equivalent if required)
- Recommended Coaxial type: Belden 1505A (or plenum equivalent if required)

All network switches shall be Extreme Networks X450e variants to comply with City of Beverly Hills standards, and shall be certified for use with QSC Qsys systems.

All new system software programming (AMX, QSYS etc), shall be created from new. All programming files shall become the property of the City of Beverly Hills upon project handover. All system passwords shall be provided to the City of Beverly Hills, with no exceptions.

Please read & review the document attachments:

- AVC Design Intent Drawings – Oct 15, 2012 – from Electrosonic
- AVC – General Specifications
- AVC Equipment List – Major Components
- AVC Cut Sheets
- AMX – Cabling for Success with DXLink
- QSC – QLAN White Paper
- QSC - QLAN Networking Overview
- Available As Built Drawings (PDF):
  - Hoffman Final AV Drawings BEVERLY_HILLS__AS_BUILD – August 03, 2006
  - TV Pro Gear Drawings – Aug 15, 2008
  - Pro Sound Audio System Drawings - Aug 02, 2001

Council Chambers

The primary Council Chambers room, located on the second floor, has an existing AVC system in place. This, in simple terms, consists of:

- Audio system – switched microphones on the council desks, DSP system, amplifiers, speakers.
- Video system – analog composite and RGBHV switching and distribution with tie-lines to the control room, flat screen LCD monitors, large LCD displays.
- Control system – AMX
- Wireless microphone and Assisted Listening systems

The intent is to replace the analog system components with a new digital system. A new networkable DSP system shall replace the Media Matrix, and a digital video

matrix shall replace the analog switching. Current video displays shall be replaced with new displays featuring LED backlighting and digital video inputs.

AV Rack Room

The AV rack room currently contains two AV racks, one large, and one small. The intent is that the small rack be removed, with some of the components, which are being reused, moved to the large rack. The large rack will require extensive re-work and cabling to accept the new AVC systems. Some components in the rack shall be required to remain, although items can be moved around in the rack as necessary. It is assumed that the re-work of the large rack will need to take place in its current position, as the rack contains a Whirlwind microphone splitter system, which is to remain. The AV Contractor can evaluate this and opt to provide a new rack if they so wish, but must incorporate the microphone splitter system into their new rack on site.

Audio

The existing cabling for speakers and microphones shall be reused. The cabling from the field terminates in an existing Audio Distribution Box (ADB) in the AV rack room. The Media Matrix system shall be replaced with a QSC Qsys system. All audio channels shall be connected to this. The AV rack has an existing Whirlwind microphone splitter system and audio patch bays – these shall remain connected, with adjustment to patch bay connections made as required to suit the new system. The Qsys Core shall be located in the Control Room downstairs, with networked Qsys I/O Frames used for connections in the Main Chamber AV rack. All Qsys audio input cards shall be CIML4-HP – High Performance versions.

The microphone control wiring is currently connected to GPIO and TTL connections in the Media Matrix 8802 devices. This wiring shall be connected to AMX I/O and Relay circuits in the new system, with new programming in AMX required to copy the functionality from the current system.

All microphones at the Council desks and Public Podium are to be replaced. Microphones shall be replaced with current model from Audio Technica, but shall have XLR base connectors (similar to Room A). New shock mounts shall be provided and fitted to the existing microphone panels, to accept the XLR type microphones

The current ceiling speakers and desk speakers shall remain, the QSC-CX254 amplifier feeing the ceiling speakers shall remain, but shall be connected to the new Qsys system via Dataport card/cables. The older Rane amplifier feeding desk speakers shall be replaced with a new QSC-CX302 amplifier, again using Dataport.

Currently, the two ceiling speakers that are overhead the Public Podium either do not function, or are mis-programmed in the system. The intent of these particular speakers is to allow the person standing at the Podium to both hear themselves, and secondly hear the Council as they talk into their microphones. AV Contractor shall investigate this small problem, establish whether the fault is the speakers, the amplifier channel,

the cabling or the programming and propose a resolution that will fix this issue in the new system.

The current Shure wireless microphone systems (two channels) shall be updated to new UR4D+ models. Liaise with the Owner regarding UHF frequency options for the Beverly Hills geographical area and agree together on final choice.

The current Assisted Listening system – Listen Technologies LT-800 shall remain in place.
The current Symetrix audio transformers and connections shall remain in place.

Video
The existing remote pan/tilt broadcast camera system is not part of this scope and is independently connected to the Control room.

All current analog video rack components are to be removed. The video system shall be replaced with an AMX Enova digital video matrix switcher and components. Existing conduit runs and junction boxes in the room are to be reused, but current coaxial cabling will need to be removed and replaced with shielded CAT6a cabling as required. Coaxial tie-lines to/from the Control room shall remain in place.

The two 65" LCD displays in the room shall be replaced with updated LED-LCD commercial grade models from Samsung. Existing wall mounting hardware shall be reused (modified if necessary) Displays shall be connected to Enova outputs via HDMI. Displays shall be connected for control via RS232 and control programming added to the AMX system. Recommended model: Samsung ME65B

The LCD flat screen monitors on the Council desks shall be replaced with larger LED-LCD models, either 16:9 or 16:10 aspect ratio with DVI or HDMI video inputs. Minimum resolution of the new displays shall be 1366x768, but 1920x1080 is an option. An HDMI model with built in audio is preferred, but the final choice of display shall be made in coordination with the Owner, as these displays can be seen on the TV broadcast cameras, so evaluation of the physical visual aspect needs to take place. The displays need to show the same cloned feed from the Enova on each, and they shall be connected via digital video splitters under the desk to an Enova output. Recommended model is Samsung S19B420M – but it I appreciated that small LCD display models change frequently, therefore final model choice shall be discussed with the Owner at the appropriate time.

The staff desk, to the south of the room shall include Enova input points, by way of Enova wall plates installed on the desks, to replace the current analog connection points. Staff PC's and/or iPads can be connected to the system at these points.

The existing DVD/VHS player shall be removed and replaced with a universal BluRay/DVD/CD player with RS232 control. An Apple TV box shall be connected in the rack enabling wireless iPad Airplay video in the room.

The Public Podium shall be refitted with Enova input panels. A new Smart Podium ID500 display device shall be provided (the existing Sympodium is to be moved to Room A) and its DVI output shall be connected to the Enova.

Control

A new network switch shall be installed in the AV rack – with new Gigabit cable connections to both Room A rack room and the Control room. AV Contractor shall verify the distance for these new cable runs and provide either copper or fiber optic connections as is appropriate to gigabit networking standards. The City of Beverly Hills uses Extreme Networks switches as their IT standard, so AV contractor shall follow suit for this project. All new AV devices shall connect to this new AV network. The AV network shall also be transporting QLAN traffic from the new Qsys DSP system.

A Wireless Access Point shall be added in the room, connected to the AV network switch. WAP shall be an Extreme Networks model.

The control shall be AMX Netlinx. The entire system programming shall be created from new to take into account the new systems and their functionality. All current touch screens shall be removed and replaced.

The existing Netlinx NI-3100 in the small AV rack shall be relocated to the large rack and become the central controller for the Chamber. A new 10” AMX surface mount touch screen shall be provided in the AV rack as the control interface for the system. The GUI for this screen shall allow for video routing, audio routing, and access to DSP functions such as microphone settings. The intercom feature shall also be enabled allowing for voice communication to the new AMX screen to be installed in the Control room. A second new desktop 10” AMX touch screen shall be located, with an RJ45 Ethernet connection panel, on the Staff Desk. The GUI for this screen shall be a simplified version of the rack screen, allowing for day to day operation as required by the staff in the Chambers. A simplified approach to the GUI should be taken, with the use of preset buttons etc.

The Public Podium raise and lower controls shall remain connected to the AMX system. The wall mounted AMX button panel (lighting control) shall remain connected to the AMX system.

It is envisioned that all system programming will be performed via laptop PC. Programming software shells shall be provided to the City of Beverly Hills by the AV Contractor so that the Owner can setup their own laptop for maintenance use and/or login to the systems from a remote PC in the control room. The AV Contractor shall provide their own laptop/PC for system programming/commissioning/training purposes.

Room A

Room A is located just outside the Council Chamber on the second floor to the south of the Chambers vestibule. Room A has an existing AVC system in place. This, in simple terms, consists of:

- Audio system – switched microphones on the Commission and staff desks, DSP system, amplifiers, ceiling speakers.
- Video system – analog composite and RGBHV switching and distribution with tie-lines to the control room, large LCD/Plasma displays, Video projector and screen.
- Control system – AMX (older Axcess system)
- Wireless microphone and Assisted Listening systems

The intent is to replace the analog system components with a new digital system. A new networkable DSP system shall replace the Shure audio mixers, and a digital video matrix shall replace the analog switching. Current video displays shall be replaced with new displays featuring LED backlighting and digital video inputs. Current video projector and screen shall be removed. Current ceiling speakers, which are no longer providing quality audio, shall be replaced with new models.

This room also requires a new pan/tilt remote camera system for Television Production use. The new camera system shall be capable of both SDI and HD-SDI operation (switchable). Four pan/tilt cameras shall be installed in the ceiling, with the remote camera control unit located in the Control room. Cameras will require new AC power supplies installed in the ceiling, as well as digital coaxial and UTP control cables run back to the Control room. The AV design drawings show provisional locations for these four cameras.

At the time of this design, no current As Built drawings for the Room A system were available. It would be in the best interest of the AV Contractor to investigate this further.

<u>AV Rack Room</u>

The AV rack room currently contains one AV rack. As very few items are to remain from the current system, notably the Assisted Listening system, it is assumed that the AV Contractor shall provide a new AV rack, with all the new components pre-installed at their shop beforehand.

<u>Audio</u>

The existing cabling for speakers and microphones shall be reused. The Shure audio mixer system shall be replaced with a QSC Qsys system. All audio channels shall be connected to this, first passing through new audio patch bays, similar to the current system in the Main Chamber. The Qsys Core shall be located in the Control Room downstairs, with networked Qsys I/O Frames used for connections in the Room A AV rack. All Qsys audio input cards shall be CIML4-HP – High Performance versions.

The microphone control wiring is assumed to be currently connected to AMX devices in the rack. This wiring shall be connected to AMX I/O and Relay circuits in the new system, with new programming in AMX required to copy the functionality from the current system.

The current ceiling speakers shall be replaced with newer models from QSC, recommended model is the AD-C152ST shallow ceiling speaker, but the AV Contractor will need to verify the best solution based on available dimensions of the current speakers. There are eight ceiling speakers, but it is not known exactly how many speaker channels there are. The current rack has three speaker level rotary volume controls, therefore a new QSC amplifier shall be required, connected to the new Qsys system via Dataport card/cables. At this stage we recommend a QSC CX-204V be used for pricing, until AV Contractor can verify actual requirement. Whatever the outcome, a QSC amplifier with Dataport shall be used.

The custom microphone panels shall have new control push buttons fitted, which shall use LED illumination, not tungsten.

The current Sennheiser wireless microphone systems (two channels) shall be updated to new Shure UR4D+ models (including new antennae). Liaise with the Owner regarding UHF frequency options for the Beverly Hills geographical area and agree together on final choice.

The current Assisted Listening system – make/model unknown - shall remain in place.

Any current audio links to the Control room shall remain in place, but shall be landed on the new audio patch bay.

Video

All current analog video rack components are to be replaced. The video system shall be replaced with an AMX Enova digital video matrix switcher and components. Existing conduit runs and junction boxes in the room are to be reused, but current coaxial cabling will need to be removed and replaced with shielded CAT6a cabling as required. Coaxial tie-lines to/from the Control room shall remain in place.

The existing DVD/VHS player shall be removed and replaced with a universal BluRay/DVD/CD player with RS232 control. An Apple TV box shall be connected in the rack enabling wireless iPad Airplay video in the room.

The ceiling mounted video projector and projection screen shall be removed. AV Contractor shall remove mounting hardware and make good any remaining holes in the ceiling. Note that the projector power drop may be reusable for the new pan/tilt camera system requirements, AV Contractor to verify.

The two 55” LCD displays in the room shall be replaced with updated LED-LCD commercial grade models from Samsung. Existing mounting hardware shall be reused

(modified if necessary) In addition, one more identical display and mounting hardware shall be provided, mounted in a similar fashion, between the current displays on the east wall. The three displays shall be set so that everyone in the room, including the Commission staff, can see one of the displays.

All three new displays shall be connected to separate Enova outputs via HDMI. Displays shall be connected for control via RS232 and control programming added to the AMX system. Recommended display model: Samsung ME55B.

The staff desk, to the west of the room, shall include Enova input points, by way of Enova wall plates installed on the desks, to replace the current analog connection points.

The Sympodium device, relocated from the Council Chambers shall have its output (VGA) connected to the Enova system at the Staff Desk.

An Owner furnished Granicus webcasting unit (video/audio input plus LAN) shall be integrated and programmed into the TV production system by the AV Contractor.

Cameras

Four new Panasonic AW-HE50SN remote pan/tilt SDI/HD-SDI cameras are to be installed in the Room A ceiling. A new Panasonic AW-RP50N camera controller shall be installed in the Control Room. Coaxial HD-SDI cables and CAT6 UTP cables shall be installed from each camera to the Control room. AC power sockets shall be provided for each camera in the ceiling. The cameras shall be installed “base up”. See AV plan for provisional location of cameras, but AV contractor shall verify final location with the Owner, which may require a site visit to set up a camera with the controller and a video monitor locally in the room to evaluate each proposed position’s view of the room. Each camera shall transmit SDI/HD-SDI signal via coaxial cable to the Control room. Each camera shall be connected for serial control from the new camera controller via UTP cable.

Control

A new network switch shall be installed in the AV rack – with new Gigabit cable connections to both Council Chamber rack room and the Control room. AV Contractor shall verify the distance for these new cable runs and provide either copper or fiber optic connections as is appropriate to gigabit networking standards. The City of Beverly Hills uses Extreme Networks switches as their IT standard, so AV contractor shall follow suit for this project. All new AV devices shall connect to this new AV network. The AV network shall also be transporting QLAN traffic from the new Qsys DSP system.

The control shall be AMX Netlinx. The entire system programming shall be created from new to take into account the new systems and their functionality. All current touch screens shall be removed.

A new AMX NI-2100 controller shall be provided and become the central controller for Room A. A new 10" AMX surface mount touch screen shall be provided in the AV rack as the control interface for the system. The GUI for this screen shall allow for video routing, audio routing, and access to DSP functions such as microphone settings. The intercom feature shall also be enabled allowing for voice communication to the new AMX screen to be installed in the Control room. A second new desktop 10" AMX touch screen shall be located, with an RJ45 Ethernet connection panel, on the Staff Desk. The GUI for this screen shall be a simplified version of the rack screen, allowing for day to day operation as required by the staff in the Room A. A simplified approach to the GUI should be taken, with the use of preset buttons etc.

It is envisioned that all system programming will be performed via laptop PC. Programming software shells shall be provided to the City of Beverly Hills by the AV Contractor so that the Owner can setup their own laptop for maintenance use and/or login to the systems from a remote PC in the control room. The AV Contractor shall provide their own laptop/PC for system programming/commissioning/training purposes.

Control Room

The Control room is located on the first floor, to the east, respectively, of the second floor location of the Council Chambers and Room A. This room is the head end of the City of Beverly Hills TV Production System. The current system, which is SDI based, is not in scope at this time for major changes. The new AV systems for the Council Chamber and Room A will, however, require some small additions to the Control room.

BEVERLY HILLS CITY HALL TV PRODUCTION CONTROL ROOM NOTE:

THE CURRENT TV SYSTEM IN THE CONTROL ROOM IS A FULLY FUNCTIONING TV BROADCAST SYSTEM. THIS UPGRADE PROJECT INCLUDES ADDING NEW EQUIPMENT TO THE SYSTEM AS SHOWN ON THE DESIGN INTENT DRAWINGS. THE AV CONTRACTOR IS ENTIRELY RESPONSIBLE & LIABLE FOR ENSURING THAT NO CURRENT FUNCTIONALITY IS INTERRUPTED OR DAMAGED. NEW AV EQUIPMENT BEING ADDED TO THE SYSTEM SHALL BE TESTED AND PROVEN BY THE AV CONTRACTOR FROM THE INITIAL POINT OF CONNECTION ALL THE WAY THROUGH THE EXISTING BROADCAST SIGNAL CHAIN DEVICES TO THE FINAL BROADCAST OUTPUT FEED POINT. ANY EXTRA PROGRAMMING OR ADJUSTMENT OF EXISTING BROADCAST EQUIPMENT IN ORDER TO INTEGRATE THE FUNCTIONALITY OF THE NEW EQUIPMENT IS SOLELY THE RESPONSIBILITY OF THE AV CONTRACTOR.

Camera Controller

The new Panasonic AW-RP50N Camera Controller (controlling the new cameras in Room A) shall be installed on the operator's console. Camera remote serial control connections via UTP cables shall be made to the new cameras in Room A. The new incoming SDI/HD-SDI coaxial signal cables shall be connected, via the existing video patch bay, to spare inputs on the existing Leitch SDI router in rack 1005. Refer to TV Pro Gear As built drawings for more details, and verify spare input channels on site.

Reprogram the existing switcher and AMX system to include the cross patching of these new channels to the Ross production switcher system as necessary.

Audio

The new DSP head end system – QSC Qsys Core 500i – shall be installed in the Control room racks. Refer to TV Pro Gear As built drawings for more details on available rack space, but it is suggested that the lower sections of rack 1002 thru 1004 be used.

The current Mackie audio mixer shall be replaced with a new Yamaha 01V96i mixer, which includes the optional 16/16 channel AES input card. Current analog I/O, via the current audio patch bay shall be reused and reconnected to the new mixer. In addition, a Qsys I/O frame shall be provided, with AES output cards – and these 16/16 channels shall be connected to the 01V96i AES card. The 01V96I shall also be connected for MIDI control to the AMX system via new AMX NI-700 and AXB-MIDI devices.

The TV Production system includes a telephone call in management system. The audio to and from this system shall be integrated and connected to the Qsys DSP system as required. AV Contractor shall provide necessary components to achieve this. This system may also need to be included in new AMX programming.

Video

A new AMX Enova digital video matrix switcher and components shall be provided in the TV Production racks. This switcher shall be connected via CAT6A cabling to the new Enova switchers in both the Council Chamber and Room A rack rooms allowing presentation video feeds to be shared between all three rooms. Inputs and outputs from/to the existing TV Production system shall be made, incorporating the use of signal converters as necessary from/to SDI. Converters shall use Open Gear standards, utilizing card frames and I/O module cards. Two of the Enova outputs shall be connected to a new Black Magic Design SmartView Duo dual screen HDSDI rack monitor allowing for direct switchable monitoring of Enova video channels. Channel selection shall be provided as part of the AMX programming.

One output of the Enova shall be connected via HDMI to a Black Magic Design Teranex 2D standards converter. This unit shall also be connected to the existing TV Production system Reference signal distribution for sync. The output of the Teranex shall be connected to the TV Production system via SDI to the existing router.

An Owner furnished Granicus webcasting unit (video/audio input plus LAN) shall be integrated and programmed into the TV Production system by the AV Contractor.

Control

A new network switch shall be installed in the AV racks – with new Gigabit cable connections to both Council Chamber rack room and Room A rack room. AV Contractor shall verify the distance for these new cable runs and provide either copper or fiber optic connections as is appropriate to gigabit networking standards. The City of Beverly Hills uses Extreme Networks switches as their IT standard, so AV contractor

shall follow suit for this project. The AV network shall be transporting QLAN traffic from the new Qsys DSP system.

In addition to the Netlinx devices mentioned under Audio above, a new desktop 19.4" panoramic AMX touch screen shall be installed and programmed. Recommended model: AMX MXT-1900L-PAN. The AMX system shall be programmed to enable remote access to both the Council Chamber and Room A AV systems, as well as access to Qsys enabling microphone channel adjustment. The intercom feature shall also be enabled allowing for voice communication to the new AMX screens to be installed in the Council Chamber and Room A. All current programmed AMX system functions for the existing Control room touch screen shall be repeated and available in the new system. The AMX system shall enable snapshot recall on the Yamaha 01V96I (via MIDI).

Programming General Note:
As part of their scope, the AV Contractor shall "storyboard" their proposed AMX and Qsys systems page layouts and functions for all three room systems in order that the Owner can be involved in this process and provide early feedback to the Contractor. The Owner would like to see a collaborative approach to this programming process.

The AV Contractor shall also include an allowance in their budget proposal for a return visit to the project site, at a time after project handover to be determined, but perhaps one month after sign off as an example, in order to make tweaks as necessary to the programming based on Owner experience and feedback from having operated the system on a daily basis.

BEVERLY HILLS CITY HALL TV PRODUCTION SYSTEMS
AUDIO/VIDEO/CONTROL SYSTEMS – GENERAL SPECIFICATIONS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. General Conditions and Division 01 Specifications apply to work of this specification. This document is not a complete reference and must be reviewed in conjunction with the AV system design drawings and documentation. AV contractor shall propose, design, engineer and provide AV system upgrades based on the design intent documents, and with ongoing consultation and coordination with the Owner.

1. AVC Design Intent Drawings – Oct 15, 2012 – from Electrosonic
2. AVC – Narrative – from Electrosonic
3. AVC Equipment List – Major Components
4. AVC Cut Sheets
5. AMX – Cabling for Success with DXLink
6. QSC – QLAN White Paper
7. QSC - QLAN Networking Overview
8. Available As Built Drawings (PDF):
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    b. TV Pro Gear Drawings – Aug 15, 2008
    c. Pro Sound Audio System Drawings - Aug 02, 2001

1.2 WORK INCLUDED (General Description)

A. The selected AV Contractor shall provide turnkey audio, visual and control systems for the City of Beverly Hills Television Production AVC Systems Upgrade project. The project address is 455 North Rexford Drive, Beverly Hills, CA 90210.

B. The AV Contractor shall provide all project management, design, engineering, supervision and installation services necessary to provide a complete and working system including, but not limited to, equipment, procurement, fabrication, system testing, commissioning, tuning and training.

C. Cable and Conduit Infrastructure – The AV Contractor shall be responsible to supply and pull all low voltage and high voltage audiovisual, network, and control cables. The AV Contractor shall be responsible for all low voltage and high voltage terminations. The AV Contractor shall verify Consultant's design package for all facility cable call outs and provide engineered drawings as required. The AV Contractor shall provide all cable engineering specifications, documentation, terminations, connectors, terminal blocks, and similar devices required for the work under this specification. The AV Contractor shall follow all signal level rules for audio visual systems and shall avoid combining signal levels together where noise could be induced into the system.

D. High Voltage - "High" voltage refers to electrical systems 100V and greater. The AV Contractor (or their approved sub-contractor) is responsible for all high-voltage systems including supplying and terminating all high-voltage connections to the AV Equipment.

E. The AV Contractor shall provide and install all connection plates. The AV Contractor shall be responsible for all terminations.

F. The AV Contractor shall bid this project as specified.

1.3 EQUIPMENT SUPPLY

A. Equipment and materials shall be provided by a factory authorized distributor to ensure proper specification adherence, final connection, test, turnover, warranty compliance, support and service.

B. This specification is based on the equipment of manufacturers who have been approved by the Owner and Consultant. The AV Contractor shall work with the Owner to identify preferred manufacturers.

C. For all items which are identified by part number and manufacturer, the performance specification which is published in the most recent manufacturer's data sheet available at the time of bidding this project shall be applicable to the present work as though fully written out herein.

D. All equipment shall be brand new. "B" stock and/or refurbished items are not acceptable unless written approval is granted by the Owner.

1.4 SERVICE AVAILABILITY

A. The AV Contractor shall be the liaison between the Owner and the manufacturer of the audiovisual equipment for all warranty support within the warranty period.

B. The AV Contractor shall have trained technicians on call to service the system should service be required.

C. The AV Contractor shall be capable of guaranteeing a phone response time of no more than twenty-four (24) hours to service calls. Trained personnel shall be available 24 hours a day, 7 days a week to service the system. Parts and technicians, as required by this specification, are required to meet this response time criteria.

1.5 CODES

A. Work shall be performed in accordance with all applicable requirements of all governing codes, rules, and regulations including the following minimum standards, whether statutory or not:

1. International Conference of Building Officials (ICBO) including but not limited to:
2. UBC Standards
3. National Electric Code
4. Local Fire Marshall
5. National Fire Protection Association (NFPA) Standards and Documents
6. Any other Federal, State or City Requirements, as applicable.
7. All equipment shall be listed by Underwriters Laboratories. (U.L)
8. ETL Inspection - The AV Contractor may be required to provide an ETL inspection for all fabricated equipment racks. It shall be the AV Contractor's responsibility to research and determine this requirement.

1.6 CONFLICTS

A. Present any conflicts between codes, regulations, specifications and/or requirements at least thirty (30) days prior to the commencement of the scheduled work. It shall be the responsibility of the Contractor to notify the City and resolve any variations in field conditions or provided materials or other discrepancies which might adversely affect the systems as specified herein.

1.7 TRAINING

A. The AV Contractor shall provide training for all AV technicians assigned by the Owner. The training shall be complete for all systems, equipment and devices furnished in this specification. The AV Contractor shall document a minimum of forty (40) hours of training with the name of the trainer and the technicians attending the training.

B. The training shall be provided by a qualified systems engineer on all systems and equipment, and shall include all instruction, troubleshooting, tools, and equipment necessary for, service, maintenance, and programming of the equipment and devices.

C. All costs and arrangements for the training including transportation, lodging and per diem during training, as well as any tools and equipment required shall be supplied by the AV Contractor.

1.8 DOCUMENTATION AND SUBMITTALS

A. AV Contractor Qualifications Submittal – Provide as part of Bid Documents

B. A completely filled out AIA Document A305 Contractor's Qualification Statement.

C. Square footage of production/fabrication space and photographs if available.

D. Photographs of previously completed A/V equipment racks showing, in detail, cable routing and dressing.

E. Sample Quality Assurance Program (QAP) and/or Factory Acceptance Test procedure (FAT) used on jobs of similar size and scope.

F. A list of names and certifications of full-time fabrication/installation technicians.

G. A list of full-time engineers and project managers including experience on projects of similar size, scope, and construction schedule of the work in the specification.

H. The name, date of employment, qualifications and experience of the project manager to be assigned to this project.

I. The name, date of employment, qualifications and experience of the site supervisor to be assigned to this project.

J. Proof that the AV Contractor has been regularly engaged in the business of AV contracting consisting of, but not limited to, engineering, fabrication, installation, and servicing of AV systems of the type specified herein for at least the past five (5) consecutive years.

K. A statement summarizing any pending litigation involving any officer or principal of/or the bidding company, the nature of the litigation, and what effect the litigation may carry as it relates to this work in the worst case scenario. Non-disclosure of this item, if later discovered, may result, at the Owner's discretion, in the AV Contractor bearing all costs attendant with the transfer of the work to a new firm and any cost related to associated delays in the progress of the work.

L. A warranty statement certifying that they are capable of conforming to the specified warranty requirements. This statement shall clarify the AV Contractor's intent and operating policy for supporting not only the manufacturer's warranty, but of the audiovisual system warranty as well.

M. Equipment Data Submittal - shall be made within thirty (30) calendar days after the award of the contract by the Owner. Submit three (3) copies of the following:

N. Complete schedule of values (SOV), including all materials, components, devices and equipment required for this work. The SOV shall be tabulated respective of each and every system as specified, and shall contain the following information for each item listed.

1. Quantity
2. Manufacturer's Name and Model Number
3. Description
4. Manufacturer's Specification Sheet with Alphanumeric ID

O. Engineering Documents Submittals - shall be made prior to any fabrication and within the time schedule approved by the Owner. All engineered construction drawings shall be drawn using ACAD 2007 or later. Refer to Division 1; Section 01300 for submittal formats and quantities. Each Submission shall include the following:

1. Plans/Device Layouts – Floor Plans and Reflected Ceiling Plans for all levels showing AV device locations throughout the facility including all equipment, equipment racks, microphone stations, antennas, speakers, video displays and other AV devices associated with the systems specified herein.
2. Field Wire Specifications – Engineered field wire drawings that clearly show source and destination points for all interconnecting audiovisual components. Wire types and color codes shall be noted where appropriate.
3. Single Lines – Complete electronic signal flow (single-line) diagrams for all systems, clearly indicating all components, connection points, type of connector to be used, and pin-out details for each connector. Note where shields are connected and where they will float to ensure the integrity of the grounding system.
4. Equipment Rack Elevations – Complete scaled equipment rack elevation drawings, including equipment designations, manufacturer's name, and model number, power distribution and requirements within the racks and connection to power panels by the electrical contractor outside the racks.
5. Equipment Room Layouts for AV Rack Rooms – Provide dimensional details including conduit entry and exit, conduit boxes, gutter boxes, cable tray and other cable management requirements.
6. AV Panel Layouts – Complete scaled AV panel drawings as well as patchbay layout drawings. All panel drawings shall include label and nomenclature details.
7. Mounting Details – Provide engineered mounting and hanging detail drawings as required.
8. Facility Impact – Provide complete facility impact documentation including, but not limited to, heat generation details by device totaled per room, power and circuit requirements for all equipment, any special loading or suspension requirements and any other facility requirements.

P. Factory Acceptance Test Submittal - No less than thirty (30) days prior to Factory Acceptance Testing, submit a written factory acceptance testing procedure for the Owner's review and approval. AV Contractor is required to invite Owner's representative to AV contractor's shop for a final review and testing of the fabricated system prior to shipping.

Q. Site Acceptance Testing Procedure Submittal - No less than thirty (30) days prior to jobsite acceptance testing, submit one (1) preliminary copy of each of the Operation and Maintenance Manuals prior to, and as requirement of, the Owner's acceptance of the work in this specification. These documents shall include:

1. Equipment operating instructions – Complete manufacturer's operation and service manuals for all devices and equipment provided as part of the work of this specification.
2. Systems operating instructions – Complete instructions for the operation of the systems provided as part of the work of this specification.
3. List of model and serial numbers for all equipment installed in the project.
4. The Acceptance Test Procedure (ATP) that will be executed after system commissioning and prior to system handover.

R. As-Built Submittal – AV Contractor shall submit the following record drawings developed from the final "As-Built" systems:

1. Refer to Division 1; Section 01300 for submittal drawing formats and quantities.
2. Three (3) copies of all data disks, including current revisions of all software used to program any system on this project and the files created that are running the systems.
3. All drawings, documentation shall be clearly labeled as "As-Built."

S. Operations & Maintenance Manuals (Final) – Based on the preliminary submittal required for Acceptance Testing, AV Contractor shall submit the final Operations and Maintenance Manuals based on record drawings developed from the final "As-Built" systems. Three (3) complete sets are required for this submittal.

1.9 DELIVERY, STORAGE AND HANDLING

A. AV Contractor shall bear the costs of all shipping to the site, and of all usual and unusual storage requirements. AV Contractor shall make appropriate arrangements, and coordinate with the authorized personnel at the site, for the proper acceptance, handling, protection, and storage of equipment to be delivered.

1.10 WARRANTY

A. Temporary Equipment: Provide and operate, without claim for additional cost or time, temporary equipment and/or systems to provide reasonably equivalent function, as determined by the Owner, in lieu of the Work of this Section which is incomplete or found not in conformance with the Contract Documents as of seven (7) days prior to the completion date. Provide such temporary equipment until Acceptance of the Work of this Section. Thereafter, remove such temporary equipment.

B. Warranty Period – AV Contractor guarantees that all of the work shall be free from defects in materials and workmanship for a period of twelve (12) months from the date of Owner acceptance, or from the date of first usage of the work by Owner personnel, whichever occurs first. The first usage date shall be agreed to in writing by the Owner and AV Contractor within five (5) working days of the first usage. Component warranty service shall apply to repairs only made necessary by normal component wear and proper component usage. The warranty service does not apply to any Owner furnished equipment and labor. Transportation of warranty substitutes, or test systems, equipment, devices material, parts and personnel to and from the jobsite shall be provided at no expense to the Owner during the warranty period. AV Contractor shall activate all manufacturers' equipment warranties in Owner's name to commence on the date of system acceptance.

C. Warranty Operations – AV Contractor shall provide the Owner with a telephone number, which during both normal working hours and during non-standard working hours, will be answered by a professional telephone answering service. In the event of a malfunction, the pre-designated owner's representative(s) will call the AV Contractor's warranty service telephone number and request service. The AV Contractor will respond to the Owner's initial service request by phone within twenty-four (24) hour's time. The AV Contractor's initial response shall consist of qualified personnel calling the Owner's facility and reviewing the service request. AV Contractor's service personnel shall then initiate a program of repair to correct the service problem as requested by the Owner.

PART 2 DESCRIPTION & PRODUCTS

2.1 SYSTEM DESIGN AND GENERAL DESCRIPTION

A. See document “BHCH TV Production - AVC Narrative Oct 15,2012”

2.2 FIRE ALARM MUTING

A. AV Contractor shall provide muting of the audio and video systems in case of a fire alarm. Fire mute shall be in accordance with the Fire Marshall of the Local Authority. It is acceptable to mute all systems upon alarm status, all mute zones and fire alarm closures must be accounted for. Muting lines will be required in both EERs and in the Classroom AV rack, and shall connect to the DSP systems GPIO (or AV switcher in the case of the Classroom) AV contractor shall coordinate this information with the MEP and those responsible for the fire alarm system.

PART 3 EXECUTION

3.1 INSTALLATION, SYSTEM COMMISSIONING, PROGRAMMING, BALANCING AND TUNING - RESPONSIBILITY

A. AV Contractor must comply with all Division 1 General Requirements for this job including but not limited to: Work Restrictions, Special Procedures for Historic Properties, Project Meetings, and Selective Removals/Cutting and Patching. The AV Contractor shall be responsible for temporary protection of floors, finishes and any other architectural element or building system that might be impacted or damaged during installation. AV Contractor shall be responsible for the packing and crating, shipping, load-in, installation, set up and testing of all audio and video systems. The AV Contractor shall use only professional installation methods and techniques. The AV Contractor shall implement a quality assurance program to insure that all professional installation practices are adhered to and followed.

B. AV device mounting – all brackets and hardware used for device mounting shall be manufacturer supplied and fit for purpose. GC is responsible for providing primary attachment points (structural backing, unistrut rails etc.). In the case of exhibit LCD monitors, acceptable mounting bracket manufacturers are:

1. Chief, Peerless, Premier

C. Secondary restraint. All AV equipment that is installed overhead, or in a location that is deemed to be potentially hazardous to the public, animal life, or property should it fall, must be installed with a secondary restraint/safety bond. Safety bonds shall attached to a secondary mounting point on the building fabric, and shall be connected to a secure secondary attachment point on the AV device. In the case of devices such as speakers, the secondary attachment point shall be on the main body of the device (i.e. the speaker cabinet), not the hanging/mounting bracket. Any AV device mounting bracket shall be deemed the primary mounting, and secondary restraint methods shall be independent of that.

D. In the case of installations adjacent to, or affected by, saltwater or saline air conditions (such as aquariums), all AV equipment shall be mounted using suitable stainless steel hardware, including all secondary restraints.

E. Once the installation of all audio and video components is complete, the AV Contractor shall be responsible for system commissioning, adjustments, programming and acceptance testing of all audio and video systems. The AV Contractor shall commission and program all logic controllers, DSP matrix routers and other audio visual software as required providing a complete and operable system. In addition, the AV Contractor shall professionally balance

and tune all audio and video systems supplied. This shall include but not be limited to equalization, delay settings and setting the gain structure of the system.

3.2 EQUIPMENT RACKS

A. Rack Equipment Installation – All equipment within each AV cabinet rack shall be logically arranged for accessibility, and convenience of maintenance. Equipment shall be mounted using rack kits installed by the manufacturer. Custom shelves by Middle Atlantic, or equivalent, are acceptable for equipment that does not have a rack mount kit available. Equipment in custom shelves shall be securely attached to the shelf. Cabinet and panel faces, including drawers, shall be black.

B. Wiring within racks and cabinets shall be installed to conform to standard broadcast and sound engineering practices as described in reference materials such as the Broadcast Audio Equipment for AM, FM, Television and Sound System Engineering. Cable lacing bars shall be used where applicable. Wiring shall be cabled, laced and securely fastened in place so that no weight is imposed on any equipment, control switch, connector, or terminal.

C. The audio system output shall be free from perceptible noise (including, but not limited to, hum or distortion) at the system's maximum operating level. The AV contractor is responsible for taking the necessary precautions to avoid noise being introduced into the audio signal paths. These precautions shall include, but not be limited to, ensuring that all wires carrying line level or microphone level audio signals are shielded, input and output circuits and terminals are installed in such a way as to provide sufficient isolation and decoupling, and utilizing an isolated grounding scheme.

D. Conductor shields for each system shall be grounded at one location only. Grounding shall be done within cabinet racks. There shall be no metallic connection between systems.

E. Permanent (laminated) cable labels shall be applied to all wires at each end and shall include identification numbers which are documented in a written cable run list.

3.3 TYPICAL ELECTRONIC EQUIPMENT ROOM GUIDELINES

A. An environmentally controlled EER shall house all centralized AV source, monitoring, signal switching, routing, processing, and transmitting equipment within equipment racks. The equipment racks and/or remote equipment locations shall provide room for basic terminations and allow in most cases room for expansion of the system.

B. The EER shall be sized to accommodate the required number of full size Middle Atlantic MRK 4436 equipment racks or existing equivalent. The Audio Video Racks (AVR) shall be installed side by side and have one meter of clearance to the front and rear and to at least one side. The equipment racks shall be attached to the floor using isolation mounts or a rubber mat to prevent ground loops that may occur should the metal rack come in contact with the building concrete.

C. Room for expansion and a work area for maintenance staff shall be considered when sizing the EER.

D. Cable ladder tray shall be above the equipment racks. If the cable comes from the floor the excess lengths shall be enough to rise from the bottom of the rack it enters to the top and then to the end of the group of racks. This will provide the installers with the excess they need to properly and neatly dress the AV cable in place. The AV installer shall coordinate with the Electrical Contractor regarding conduit stub ups in the EER and ladder tray layouts.

E. The EER/Remote storage locations shall be climate controlled.

F. An air conditioning system shall be provided at all AVC (Audio Video & Control) equipment locations. Each system shall be capable of dissipating the BTUs/Hr indicated in the AV facility impact reports. The BTUs/Hr listed shall represent the heat produced by the AVC equipment only and shall not include ambient room conditions. The air conditioning system shall be able to maintain an environment where the temperature does not rise above 75° Fahrenheit, and the relative humidity is below 75%.

G. All electrical transformers, breaker panels and lighting dimmers shall be a minimum of two meters away from the equipment racks, preferably in another room.

H. All equipment specified shall operate on local electrical power standards (120 V AC 60 Hz) unless otherwise noted.

I. The Video system requires a ground isolated type power system.

J. All AVC circuits shall be supplied from the same electrical panel. This panel shall derive its power from an isolation transformer. The power panel shall not furnish power to any other equipment.

K. Each AVC circuit shall have a ground and neutral conductor equal in size to the current carrying conductor.

L. All conduits entering AVC Equipment Racks shall be electrically isolated from the rack.

M. It is standard practice in our industry that AV systems use isolation transformers and isolated (technical) grounding to prevent interference from other systems installed in the facility. Examples of this practice can be found at http://www.middleatlantic.com/power.htm.

N. It is standard practice that the isolation transformers are specified and designed into the system by the Electrical Engineer (EE) based upon the estimated power loads provided and supplied as part of the Facility Impact Estimated Power and Heat Load reports generated by the AVC designer.

O. To maintain the highest quality presentation, Electrosonic recommends using an isolation transformer and isolated ground between all AVC system outlets and the first breaker panel after the transformer to prevent any potential electrical interference in the audio and video systems. Without using a separately derived power source (transformer) for all AVC show system racks and field equipment such as projectors, there is the potential for interference from electric motors used in Window Treatments, Show Action Equipment (SAE), the HVAC systems, or other subsystem electronics that we cannot be aware of at this time.

3.4 AV PANELS

A. AV Panels shall be black anodized aluminum brushed in the direction of the aluminum grain. Lettering shall be 1/8” engraved with white paint fill. Panels with connectors that are not square to the panel will not be accepted. The AV Contractor is responsible for submitting scaled engineering drawings for all AV Panels prior to fabrication. P-Touch or similar non-permanent labeling shall not be acceptable. Care shall be taken by the AV contractor that the different requirements of surface mount panels versus flush mount panels shall be factored. All flush mount panels shall be approximately ¼” larger all round than the related back box to ensure a professional finished look.

3.5 OPERATION AND MAINTENANCE TRAINING

A. The AV Contractor shall properly instruct the Owner and other persons designated by the Owner, in correct operation, maintenance and troubleshooting of the system. Prior to this training session, a preliminary copy of the Operations and Maintenance Manual set must be submitted to the Owner for use during the training session.

B. AV Contractor shall be available on site for the first formal use of the system as well as instructing the Owner's designated people during the pre-opening.

3.6 GENERAL PERFORMANCE REQUIREMENTS AND EXPECTATIONS

A. Reproduction of speech and music reinforcement shall be clear, of high fidelity, and with all frequencies within range of system faithfully reproduced with no detectable noise, hum, or distortion.

B. Reproduction shall be attained at sound levels sufficient to override noise levels typical for performing arts centers, to provide a thoroughly satisfactory and serviceable system

C. Audio system shall be capable of continuous sound pressure levels of 95dB at the audience position with no audible distortion and a frequency response from 55Hz to 20 kHz (+/– 3dB).

D. The Video systems shall be balanced within 3 dBmV at the origin point across the entire video distribution. Each video monitor will have a uniform picture free of any noise, ghosting or hum bars. Each video monitor shall receive a signal level between 5 and 10 dBmV.

3.7 FIELD QUALITY CONTROL

A. The AV Contractor shall maintain a competent project manager and supporting technical personnel, acceptable to the Owner during the entire installation. Change of supervisor during the project shall not be acceptable without prior written approval from the Owner.

B. Before connecting any equipment to electrical power outlets, AV contractor shall measure and record the A.C. voltages between hot, neutral and ground to verify correct outlet polarity, and record all findings. All high-voltage terminations shall be performed by others.

C. Physical inspection of the rack and field wiring shall be done by the Owner to insure neat and orderly installation practices have been upheld.

D. Verify the performance parameters of the individual systems following established professional procedures. The AV Contractor shall document all acceptance testing, include the date the tests were performed, who performed the tests and the equipment used in testing. Where discrepancies are found in testing, AV Contractor shall go back, fix the discrepancy, retest all the affected areas and/or systems, and document the date, the new test results, what was done to fix the problem, and the persons responsible for fixing and retesting.

E. For audio testing the AV Contractor shall follow EIA standards RS160 and RS219, and make all necessary corrections to bring systems into compliance. Testing shall include but is not limited to:

F. Measuring all speaker line impedance at 250, 500, 1k and 2k Hz with loudspeakers connected to each line. Turn all volume controls (where installed) to maximum setting before testing.

G. Checking phasing on all speakers in every zone.

H. Correcting any variances for the entire zone and then retesting.

I. Testing all line and microphone (wired and wireless) level signals for polarity and continuity.

J. Verifying all video signals utilizing forward and reverse sweep and balance, hum modulation, outlet levels at high and low channel of pass-band and complete comparison of calculated values vs. observed values of tap outlets.

K. The process of testing and equalization of the systems may necessitate the moving, re-aiming, adjusting or reconfiguring of system components. This shall be done at the Owner or consultant's request with no additional claim for payment.

L. Upon completion of the installation and all preliminary testing, the AV Contractor shall submit in writing all test results, and submit notification that the system installation is complete and in compliance with the contract documents and is ready for inspection by the Owner and the Owner's consultant.

3.8 TEST EQUIPMENT

A. The AV Contractor shall provide the following test equipment to be available for the Owner or Consultant at any time after the substantial completion of the project.

1. Digital Multi-meter
2. NTSC Television Generator with multiple patterns including color bars, solid white, solid black and vertical/horizontal lines for alignment of video screens.
3. System Analyzer for RF systems
4. NTSC Waveform Monitor
5. NTSC Vectorscope
6. Real time Spectrum Analyzer (handheld or computerized is acceptable)
7. Laptop computer with all software required to make adjustments to any component of the system.
8. All cables, ladders, tools and adapters for system programming, inspection, testing and acceptance.
9. Technicians familiar with the system to facilitate the required modifications (as required).

PART 4 EQUIPMENT LIST

4.1 See document "BHCH TV Production –AVC Equipment List Oct 15, 2012"

4.2 The equipment list outlines the major components of the AV systems. The AV contractor shall study and engineer the AV design package to determine all components required to provide a fully functioning system. The AV contractor shall supply all components, not necessarily listed in the attachment, in order to provide a fully functioning system.

4.3 Equipment substitutions are only allowed with the approval of the Owner team and shall be listed separately in any bid proposal stating reasons for proposed substitution.

4.4 Cut Sheets have been provided as a reference resource for AV system major components.

4.5 The Owner reserves the right to make changes to the system components. In addition, the Owner may take the option to furnish some equipment to the project themselves, by way of purchase, sponsorship deals, rentals etc. The AV contractor shall keep up a good relationship with the Owner to discuss these items over the course of the project

PART 5 AV CABLING CLARIFICATION.

5.1 AV CABLE SIGNAL SEPARATION WITHIN CONDUIT - CLARIFICATION.

Signal separation refers to providing physical distance among cables carrying various signal levels. This protects weaker low voltage signals from noise and interference. Signal separation principles apply to cable routing and installation. According to EIA/TIA, network cabling has a mandated signal separation from power cables of 2½ inches (60mm). When

grouping cables together in a bundle, all cables in that bundle should be intended for only one signal type. Generally, cables should be grouped according to these categories:

1. Microphone
2. Line Level and communications (includes theatrical intercom)
3. Control and data
4. Speaker
5. Video
6. RF (includes wireless microphone and assisted listening antennae)
7. AC Power

Above all, keep the microphones cables separated from the others. They are the most susceptible to interference since microphone signal level is so low.

If signal lines must cross, it is best if they do so at 90 degrees to minimize cross coupling.

The same grouping and separation also applies to cable tray paths and open cable routes (J-hooks)

Cable bundling:

It shall be noted that where multiple cables of the same type, that conform to the groups above, are to transit from a common source point to a common termination point, larger trunk conduits should be used to carry these cables in bundles. Distribution boxes shall be added where the Contractor feels that costs can be saved by doing so. This note also applies to the use of cable trays and J-Hooks.

This approach shall be used wherever the Contractor sees the opportunity, and they shall provide suitably sized junction boxes as part of their scope. Note: it is still the responsibility of the Contractor to install the cable all the way from the source point to the termination point, regardless of the conduit methodology used.

PART 6 AV CUT SHEETS – MAJOR COMPONENTS.

6.1 See document “BHCH TV Production - AVC Cut Sheets Oct 15,2012”

BEVERLY HILLS CITY HALL

455 N. REXFORD DRIVE

BEVERLY HILLS, CA 90210

TELEVISION PRODUCTION AVC SYSTEMS UPGRADE

DESIGN INTENT DOCUMENTS

OCTOBER 15, 2012

AV GENERAL NOTES FOR OWNER, ARCHITECT & GENERAL CONTRACTORS

EQUIPMENT PLANS, TECHNICAL DRAWINGS AND DOCUMENT NOTES:

1. THESE AV EQUIPMENT PLANS, TECHNICAL DRAWINGS AND DOCUMENTS ARE TO ILLUSTRATE GENERAL AV SYSTEMS INTEGRATION CONCEPTS ONLY. THE EXACT LOCATIONS AND INSTALLATION METHODS OF ALL ASSOCIATED DEVICES SHALL BE COORDINATED WITH THE AV SYSTEMS DESIGNER, GENERAL CONTRACTOR, CONSULTING ELECTRICAL ENGINEER, ELECTRICAL CONTRACTOR AND THE APPROPRIATE AUTHORITIES HAVING JURISDICTION. THE LOCATIONS CONTAINED HEREIN ARE BASED SOLELY ON PRELIMINARY DESIGNS AND ALL FINAL LOCATIONS ARE TO BE VERIFIED WITH THE OWNER'S REPRESENTATIVE ON SITE PRIOR TO INSTALLATION.

2. THE AV SYSTEMS DESIGNER HAS TAKEN GREAT CARE TO PREVENT CONFLICTS IN THE REQUIREMENTS THAT ARE DETAILED HERE IN THESE TECHNICAL DRAWINGS AND DOCUMENTS. HOWEVER, IF A CONFLICT IS IDENTIFIED, THE APPROPRIATE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE AV SYSTEMS DESIGNER IN WRITING AS TO THE NATURE OF THE CONFLICT NOTED SO CLARIFICATIONS CAN BE PROVIDED AND A RESOLUTION IMPLEMENTED.

3. NO CHANGE OR MODIFICATION OF DESIGN SHALL OCCUR WITHOUT WRITTEN APPROVAL OF AV SYSTEMS DESIGNER.

4. THE INFORMATION AND DESIGNS EXPRESSED HEREIN ARE PROPRIETARY AND CONFIDENTIAL AND MAY NOT BE USED OR COPIED WITHOUT THE EXPRESS WRITTEN CONSENT OF ELECTROSONIC INC., 3320 NORTH SAN FERNANDO BLVD., BURBANK, CA 91504.

INSTALLATION NOTES:

1. THE DESIGNATED GENERAL AND ELECTRICAL CONTRACTORS (SPECIFIED HEREIN AS "THE CONTRACTORS") SHALL PROVIDE, LOCATE AND INSTALL ALL AV SYSTEMS CONDUIT, CABLE, CABLE PULLS, CABLE TRAYS, CABLE TERMINATORS, BUSHINGS, J-BOXES, FLOOR BOXES, ENCLOSURES, PLATES AND PANELS, POWER CIRCUITS, POWER CABLE, POWER CONNECTIONS, ETC. DESCRIBED IN THESE DOCUMENTS. THE CONTRACTORS SHALL DETERMINE SCOPE OF WORK WITHIN THEIR DISCIPLINES. THE DESIGNATED AV CONTRACTOR SHALL PROVIDE ALL OTHER CUSTOM AV SYSTEMS CONNECTOR PANELS AND DEVICES, AS NOTED: "BY AV CONTRACTOR".

2. THE CONTRACTORS ARE RESPONSIBLE FOR ADHERING TO ALL NATIONAL AND LOCAL ELECTRICAL, FIRE AND BUILDING CODE REQUIREMENTS.

3. ALL AV SYSTEMS EQUIPMENT SHALL BE PROVIDED WITH STANDARD MANUFACTURER'S COLOR AND FINISH UNLESS OTHERWISE SPECIFIED BY THE OWNER AND APPROVED BY AV SYSTEMS DESIGNER PRIOR TO BID AND INSTALLATION.

4. ALL AV SYSTEMS DEVICE MOUNTING ATTACHMENTS SHALL BE DESIGNED TO PROVIDE EASE OF MAINTENANCE AND SERVICE. STAINLESS STEEL SAFETY CABLES SHALL BE INSTALLED ON ALL SUSPENDED EQUIPMENT.

5. THE CONTRACTORS SHALL SUPPORT ALL AV SYSTEMS LOUDSPEAKER ENCLOSURE ASSEMBLIES FROM STRUCTURE RATHER THAN FROM THE FACILITY FINISHED CEILING, PROVIDING SAFETY CABLES TO STRUCTURAL STEEL AND SEISMICALLY BRACE EQUIPMENT AS REQUIRED.

6. THE CONTRACTORS SHALL PROVIDE A MINIMUM OF 36" (915mm) UNOBSTRUCTED ACCESS FROM THE FRONT AND REAR OF ALL FREE STANDING AV SYSTEMS RACK ASSEMBLIES, UNLESS OTHERWISE NOTED.

7. THE CONTRACTORS SHALL PROVIDE A MINIMUM OF 36" (915mm) UNOBSTRUCTED ACCESS ON ONE SIDE OF ALL FREE STANDING AV SYSTEMS RACK ASSEMBLIES, UNLESS OTHERWISE NOTED.

8. THE CONTRACTORS SHALL PROVIDE A MINIMUM OF 36" (915mm) UNOBSTRUCTED ACCESS FROM THE FRONT OF ALL WALLS MOUNTED AV SYSTEMS RACK ASSEMBLIES, UNLESS OTHERWISE NOTED.

9. THE CONTRACTORS SHALL PROVIDE A MINIMUM OF 12" (305 mm) UNOBSTRUCTED ACCESS FROM THE TOP OF ALL AV SYSTEMS RACK ASSEMBLIES TO THE BOTTOM OF ALL OVERHEAD CABLE TRAY ASSEMBLIES AND 12" (305mm) FROM THE TOP OF ALL CABLE TRAY ASSEMBLIES TO THE FACILITY FINISHED CEILING, UNLESS OTHERWISE NOTED.

10. THE CONTRACTORS SHALL INSTALL AV SYSTEMS LOUDSPEAKER BACK BOXES THAT ARE PROVIDED BY THE AV SYSTEMS CONTRACTOR. THE AV SYSTEMS CONTRACTOR SHALL INSTALL AND TERMINATE (LOW VOLTAGE ONLY) AT ALL AV SYSTEMS LOUDSPEAKERS, VIDEO MONITORS, PROJECTORS, PROJECTION SCREENS, CUSTOM PANELS AND AV SYSTEMS CONTROL DEVICES.

11. THE CONTRACTORS SHALL PROVIDE ALL CABLE RUNS TERMINATING AT SPEAKER BREAKOUT BOX LOCATIONS. THESE RUNS SHALL BE ENCLOSED IN FLEX CONDUIT REACHING TO THE SPEAKER TERMINATION POINTS AND CONTAIN A MINIMUM 36" (915mm) PIGTAIL AT LOUDSPEAKER FOR CONNECTION BY THE AV CONTRACTOR.

12. THE CONTRACTORS SHALL PROVIDE A SERVICE LOOP NO LESS THAN 10'-0" (3.1M) AT ALL AV SYSTEMS RACK LOCATIONS AND NO LESS THAN 36" (915mm) AT ALL AV SYSTEMS PULL AND BREAKOUT BOXES, UNLESS OTHERWISE NOTED.

13. ALL AV SYSTEMS JUNCTION BOXES AND OTHER WIRING DEVICES ARE SUGGESTED MINIMUM SIZES AND CAN BE INCREASED IN SIZE WITH SUITABLE TIMELY NOTIFICATION TO AND AGREEMENT FROM THE AV SYSTEM DESIGNER AND AV CONTRACTOR. AV SYSTEMS DESIGNER AND/OR AV CONTRACTOR ASSUMES NO RESPONSIBILITY FOR SIZING OF CONDUIT. THE SIZE VALUES IN THIS DOCUMENT ARE ESTIMATES ONLY AND MUST BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION, LOCAL AND NATIONAL CODES FOR CONDUIT FILL AND PULLING TENSION.

14. ALL AV SYSTEMS MOUNTING HEIGHT IS TO BOTTOM OF DEVICE, UNLESS OTHERWISE NOTED.

INSTALLATION NOTES (CONTINUED):

15. ALL AV SYSTEMS MINIMUM STANDARD RECEPTACLE HEIGHT IS 15 INCHES (380mm) ABOVE FINISHED FLOOR, UNLESS OTHERWISE NOTED.

16. ALL AV SYSTEMS MINIMUM STANDARD SWITCH HEIGHT IS 48 INCHES (1220mm) ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED.

17. ALL AV SYSTEMS BOXES AND CONDUIT IN NEW WALLS AND CEILINGS SHALL BE FLUSH MOUNTED OR CONCEALED FROM GUESTS VIEW, UNLESS OTHERWISE NOTED.

18. ALL AV SYSTEMS DEVICE PLATE FINISHES AND TYPE ARE TO BE VERIFIED IN WRITING WITH THE ARCHITECT AND/OR SCENIC DESIGNER WITH AV SYSTEMS CONTRACTOR.

CABLING AND CONDUIT NOTES:

1. ALL AV SYSTEMS WIRING SHALL BE IN CONDUIT UNLESS OTHERWISE NOTED. LOW LEVEL AUDIO CABLES, CONTROL CABLES, VIDEO CABLES AND HIGH LEVEL SPEAKER CABLE SHALL BE ROUTED IN SEPARATE GALVANIZED STEEL CONDUITS WITH A MINIMUM 6 INCHES (155mm) SPACING. VERIFY IN WRITING THE COMBINING OF HOME RUNS WITH THE AV CONTRACTOR PRIOR TO BID AND INSTALLATION.

2. ALL AV SYSTEMS CABLE RUNS, INCLUDING COAX CABLE, MUST BE CONTINUOUS FROM SOURCE TO DESTINATION WITHOUT SPLICES. NO EXCEPTIONS.

3. THE CONTRACTORS SHALL PROVIDE PLENUM RATED CABLES IF REQUIRED BY AUTHORITY HAVING JURISDICTION.

4. ALL AV SYSTEMS CONDUIT SHALL NOT EXCEED 100 FEET (30.1M) OR A TOTAL OF 270 DEGREES IN BENDS BETWEEN PULL BOXES OR AS RECOMMENDED BY CABLE MANUFACTURER.

5. THE CONTRACTORS SHALL PERMANENTLY AND UNIQUELY LABEL ALL CABLE, CONDUIT AND BOXES FOR EASE OF IDENTIFICATION.

6. THE CONTRACTORS SHALL PULL A METERED AND LABELED PULL STRING IN ALL CONDUITS, REGARDLESS OF FILL.

7. ALL CABLING SHALL BE TESTED FOR CONTINUITY PRIOR TO CONNECTION TO AV EQUIPMENT BY THE CONTRACTORS. ALL CATEGORY 5 (CAT5) AND CATEGORY 5E (CAT5E) CABLES SHALL BE TESTED TO BISCI STANDARDS AND A TEST REPORT PROVIDED PRIOR TO CONNECTION OF ALL AV SYSTEMS OR SHOW EQUIPMENT AFTER TERMINATION INTO THE DESIGNATED JACKS.

POWER CONNECTION NOTES:

1. THE CONTRACTORS SHALL USE #12 AWG MINIMUM STRANDED COPPER CONDUCTORS FOR ALL AV POWER CIRCUITS, UNLESS OTHERWISE NOTED. ALL AV CIRCUITS WILL BE FED FROM THE AV ISOLATED GROUND POWER PANEL. THE ISOLATED GROUND POWER PANEL SHALL BE FED FROM A DEDICATED SHIELDED ISOLATION TRANSFORMER.

2. ALL AV SYSTEMS CIRCUITS REQUIRE INDEPENDENT NEUTRAL, GROUND AND ISOLATED GROUND CONDUCTORS OF EQUAL CURRENT CARRYING CAPACITY PER CIRCUIT, UNLESS OTHERWISE NOTED.

3. ALL AV SYSTEMS INTER-RACK AND INTERNAL DEDICATED ELECTRONIC ENCLOSURE WIRING TO BE PROVIDED BY THE INSTALLING AV CONTRACTOR, UNLESS OTHERWISE NOTED.

ELECTRONIC EQUIPMENT ROOM (EER) REQUIREMENTS:

1. THE CONTRACTORS TO INSURE THAT ALL ELECTRONIC EQUIPMENT ROOMS BE CLEAN AND DUST FREE PRIOR TO INSTALLATION OF ANY AV ELECTRONIC EQUIPMENT.

2. THE CONTRACTORS TO PROVIDE SEPARATE DEDICATED HVAC UNIT CAPABLE OF CONTINUOUS 24 HOURS OF UNINTERRUPTED OPERATION PER DAY FOR THE ELECTRONIC EQUIPMENT ROOM. THIS UNIT SHALL BE OPERATIONAL FOR MINIMUM OF 48 HOURS AND THE FILTERS REPLACED PRIOR TO INSTALLATION OF AV SYSTEMS RACKS.

3. ADDITIONAL POWER SPECIFICATIONS AND HVAC REQUIREMENTS TO BE DETAILED IN THE CONSTRUCTION DOCUMENTS. THE ELECTRONIC EQUIPMENT ROOM SHALL BE MAINTAINED FROM 65ÅF TO 75ÅF AND 10% TO 90% RELATIVE HUMIDITY NON-CONDENSING.

4. THE CONTRACTORS SHALL SEAL ALL CONCRETE SURFACES, WALLS, FIRE PROOFING, ETC. AND/OR PROVIDE VINYL FLOOR, PAINTED WALLS AND DROP ACOUSTICAL CEILING IN THE ELECTRONIC EQUIPMENT ROOM TO PREVENT DUST IN THE EQUIPMENT AREA THAT WILL AFFECT THE AV SYSTEMS SHOW EQUIPMENT.

LIFE-SAFETY SYSTEMS:

1. ALL LIFE-SAFETY SYSTEM RELATED DESIGN, ENGINEERING, PROCUREMENT, AND INSTALLATION IS BY GENERAL CONTRACTOR.

2. FACILITY FIRE ALARM SYSTEM SHALL PROVIDE A SET OF DRY NORMALLY CLOSED CONTACTS TO INHIBIT AV, LIGHTING AND SHOW SYSTEM DURING A FIRE CONDITION WHEN REQUIRED BY THE AUTHORITY HAVING JURISDICTION.

AV DRAWING SHEET INDEX

DESIGN INTENT
NOT FOR CONSTRUCTION

client

BEVERLY HILLS
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ELECTROSONIC
DESIGN CONSULTING

ISSUE
description: DESIGN INTENT
date: OCT 15, 2012
approved:

REVISIONS

rev	date	description

project no.: DEC100167
cad file:
scale: NONE
engineer: S. COE
drawn: EDC
created: OCTOBER 05, 2012
area/attraction:

project: TELEVISION PRODUCTION AVC SYSTEMS UPGRADE

title: AV SHEET INDEX & GENERAL NOTES

sheet no.: AV0.01
rev:

AV DEVICE ABBREVIATIONS

NOTE: THE DEVICE ABBREVIATIONS LISTED HEREIN ARE NOT ALL NECESSARILY USED IN THIS DESIGN PACKAGE

ADA	AUDIO DISTRIBUTION AMPLIFIER
AMP	AUDIO AMPLIFIER
ANT	ANTENNA
APB	AUDIO PATCH BAY
ASP	AUDIO SIGNAL PROCESSOR
ASW	AUDIO SWITCH
AVR	AUDIO/VIDEO RACK
BLN	AUDIO / VIDEO BALUN
CAM	VIDEO CAMERA
CDP	CD PLAYER
CNV	MEDIA / SIGNAL CONVERTER
COM	INTERCOM SYSTEM COMPONENT
CON	AUDIO / VIDEO / CONTROL CONSOLE
CPU	GENERAL PURPOSE ADMINISTRATIVE COMPUTER
CTL	CONTROL SYSTEM DEVICE / COMPONENT
CTP	CONTROL PANEL
DAP	DIGITAL AUDIO PLAYER
DMX	DMX512 INTERFACE EQUIPMENT
DSP	DIGITAL SIGNAL PROCESSOR
DVD	DVD PLAYER
EXR	AUDIO / VIDEO / CONTROL EXTENDER - RECEIVER
EXT	AUDIO / VIDEO / CONTROL EXTENDER - TRANSMITTER
FAN	EQUIPMENT COOLING FAN
FPB	FIBER OPTIC PATCH BAY
GEN	SYNC GENERATOR
HDP	HIGH DEFINITION PLAYER / VIDEO SERVER
ICP	INTERCONNECT PANEL
IEM	IN-EAR MONITOR
IPM	INPUT MODULE
JBX	JUNCTION BOX
KBD	STAND-ALONE KEYBOARD
KVM	KVM COMPONENTS
LCD	LCD FLAT-PANEL DISPLAY
LED	LED COMPONENT
MIC	MICROPHONE
MID	MIDI INTERFACE
MIX	AUDIO / VIDEO MIXER
MLE	MISCELLANEOUS LOOSE EQUIPMENT
MON	GENERAL PURPOSE BROADCAST OR COMPUTER MONITOR
MSE	STAND-ALONE MOUSE
NET	ETHERNET CONTROL DEVICE
OPM	OUTPUT MODULE
PDP	PLASMA DISPLAY PANEL
PRJ	VIDEO PROJECTOR
PTZ	PAN / TILT / ZOOM CONTROLLER
PWR	POWER RELATED COMPONENTS
RCV	IR / RF RECEIVER
REM	REMOTE CONTROL
SCR	PROJECTION SCREEN
SDP	STANDARD DEFINITION PLAYER / VIDEO SERVER
SPK	SPEAKER
TBL	TERMINAL BLOCK
TJB	TERMINAL JUNCTION BOX
TSC	INTERACTIVE KIOSK TOUCHSCREEN
UPS	UNINTERRUPTIBLE POWER SUPPLY
VCR	VIDEO CASSETTE RECORDER
VDA	VIDEO DISTRIBUTION AMPLIFIER
VPB	VIDEO PATCH BAY
VSP	VIDEO SIGNAL PROCESSOR
VSW	VIDEO SWITCH
XTR	IR / R
XTR	IR / RF TRANSMITTER

AV DEVICE ABBREVIATION KEY

[XXX][NN]-[DD]

- [DD] DESIGNATES EQUIPMENT TYPE UNIQUE NUMBER
- [NN] DESIGNATES EQUIPMENT TYPE MANUFACTURER AND MODEL
- [XXX] AV DEVICE ABBREVIATION: DESIGNATES EQUIPMENT TYPE BY CATEGORY

AV GENERAL ABBREVIATIONS

NOTE: THE GENERAL ABBREVIATIONS LISTED HEREIN ARE NOT ALL NECESSARILY USED IN THIS DESIGN PACKAGE

A	AMP(S)
AC	ALTERNATING CURRENT
ADA	AMERICANS WITH DISABILITY ACT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
ARCH	ARCHITECT or ARCHITECTURAL
AV	AUDIO VISUAL SHOW SYSTEMS
AWG	AMERICAN WIRE GAUGE
&	AND
Ñ	APPROXIMATELY (PLUS OR MINUS)
@	AT
BGM	BACKGROUND MUSIC
BLDG	BUILDING
BS	BACKSTAGE
CL	CENTER LINE
CS	CENTER STAGE
DET	DETAIL
Ĭ	DIAMETER OR PHASE
DEL	DELETED
DIA	DIAMETER
DIM	DIMENSION
DMX	DIGITAL MULTIPLEX SIGNAL
DS	DOWN STAGE
DSC	DOWN STAGE CENTER
DSL	DOWN STAGE LEFT
DSR	DOWN STAGE RIGHT
DWG	DRAWING
E	EAST
EA	EACH
EC	ELECTRICAL CONTRACTOR
EE	ELECTRICAL ENGINEER
ELEC	ELECTRIC
ENCL	ENCLOSURE
EQ	EQUAL
EQUIV	EQUIVALENT
EST	ESTIMATED
EXST	EXISTING
FF	FINISHED FLOOR
FG	FINISHED GRADE
FL	FLOOR
FOH	FRONT OF HOUSE
FT	FOOT or FEET
GC	GENERAL CONTRACTOR
GFI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
HOR	HORIZONTAL
HT	HEIGHT
HVAC	HEATING, VENTILATION & AIR CONDITIONING
IN	INPUT
IN	INCH or INCHES
J-BOX	ELECTRICAL JUNCTION BOX
KVA	KILOVOLT AMPS
Kg	KILOGRAMS
KW	KILOWATTS
LB(S)	POUND(S)
LED	LIGHT EMITTING DIODE
LT(G)	LIGHTING
MAX	MAXIMUM
M	METER
mm	MILLIMETER
MFG	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
N	NORTH
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO	NUMBER
<	NOT TO EXCEED or LESS THAN
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFE	OWNER FURNISHED EQUIPMENT
OS	OFF STAGE
OUT	OUTPUT
PR	PAIR
R	RADIUS
RCP	REFLECTED CEILING PLAN
REV	REVISION
REQ	REQUIRED
RF	RADIO FREQUENCY
RM	ROOM
RU	RACK UNIT(S) (1.75"/45mm)
S	SOUTH
SCHD	SCHEDULE
SE	STRUCTURAL ENGINEER
SEC	SECTION
SHBD	SHEET BORDER OR TITLE BLOCK
SHT	SHEET
SL	STAGE LEFT
SPEC	SPECIFICATION
SR	STAGE RIGHT
S/S	STAINLESS STEEL
STD	STANDARD
SUSP	SUSPENDED
TBD	TO BE DETERMINED
TEMP	TEMPERATURE
TEL	TELEPHONE
TYP.	TYPICAL
U.O.N.	UNLESS OTHERWISE NOTED
US	UPSTAGE
USC	UPSTAGE CENTER
USL	UPSTAGE LEFT
USR	UPSTAGE RIGHT
V	VOLT(S)
VAC	VOLTS ALTERNATING CURRENT
VERT	VERTICAL
VIF	VERIFY IN FIELD
W	WATT(S) or WEST
W/	WITH
W/O	WITHOUT
WT	WEIGHT

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drawn:
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project: TELEVISION PRODUCTION AVC SYSTEMS UPGRADE

title: AV ABBREVIATIONS

sheet no.: AV0.02
rev:

AV SYMBOL LEGEND - CONNECTOR SYMBOLS

NOTE: THE SYMBOLS DEPICTED ARE NOT TO SCALE AND ARE NOT ALL NECESSARILY USED IN THIS DESIGN PACKAGE.

AUDIO


1/4" PHONE FEMALE

1/8" MINI FEMALE


NL4 FEMALE


RCA FEMALE

RCA FEMALE

XLR


XLR-3 FEMALE


XLR-3 MALE


XLR-4 FEMALE


XLR-4 MALE


XLR-5 FEMALE


XLR-6 MALE

POWER


DC FEMALE


IEC MALE

VIDEO AND RF


BNC FEMALE


BNC FEMALE

DB15HD FEMALE


DB15HD MALE


RF FEMALE


RF FEMALE


S-VIDEO FEMALE


TNC FEMALE

CONTROL AND NETWORK

DB9 FEMALE

DB9 MALE

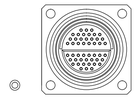

FIBER FEMALE


RJ45 MALE

MULTI-PIN


WHIRLWIND W1


WHIRLWIND W2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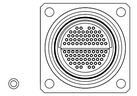
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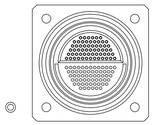
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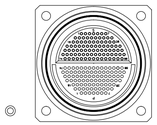
WHIRLWIND W4


EDAC 56


EDAC 90

AV SYMBOL LEGEND

NOTE: NOT ALL SYMBOLS DEPICTED ARE NECESSARILY USED IN THIS DESIGN PACKAGE.

PLAN SYMBOLS

AUDIO DEVICES

SPK[NN]–[DD] (S) — INDICATES CEILING MOUNTED SPEAKER TYPE AND NUMBER

SPK[NN]–[DD] (S) +XX AFF — INDICATES SURFACE MOUNTED SPEAKER TYPE, NUMBER AND MOUNTING HEIGHT ABOVE FINISHED FLOOR, IF APPLICABLE

SPK[NN]–[DD] (S) — INDICATES FLOOR OR IN-GROUND MOUNTED SPEAKER TYPE AND NUMBER

ELECTRICAL DEVICES

XXXVAC / XXA — INDICATES CEILING MOUNTED DUPLEX RECEPTACLE, VOLTAGE AND AMPERAGE

XXXVAC / XXA +XX AFF — INDICATES SURFACE MOUNTED DUPLEX RECEPTACLE, VOLTAGE, AMPERAGE AND MOUNTING HEIGHT ABOVE FINISHED FLOOR, IF APPLICABLE

XXXVAC / XXA — INDICATES FLOOR OR IN-GROUND MOUNTED DUPLEX RECEPTACLE, VOLTAGE AND AMPERAGE

XXXVAC / XXA — INDICATES CEILING MOUNTED QUAD RECEPTACLE, VOLTAGE AND AMPERAGE

XXXVAC / XXA +XX AFF — INDICATES SURFACE MOUNTED QUAD RECEPTACLE, VOLTAGE, AMPERAGE AND MOUNTING HEIGHT ABOVE FINISHED FLOOR, IF APPLICABLE

XXXVAC / XXA — INDICATES FLOOR OR IN-GROUND MOUNTED QUAD RECEPTACLE, VOLTAGE AND AMPERAGE

NOTE: ALL DUPLEX AND QUAD RECEPTACLES ARE 120VAC 60Hz, UNLESS OTHERWISE NOTED.

ELECTRICAL DEVICES (CONTINUED)

XXXVAC / XXA — INDICATES CEILING MOUNTED SPECIAL ELECTRICAL SERVICE, VOLTAGE AND AMPERAGE

XXXVAC / XXA +XX AFF — INDICATES SURFACE MOUNTED SPECIAL ELECTRICAL SERVICE, VOLTAGE, AMPERAGE AND MOUNTING HEIGHT ABOVE FINISHED FLOOR, IF APPLICABLE

XXXVAC / XXA — INDICATES FLOOR MOUNTED ELECTRICAL SERVICE, VOLTAGE AND AMPERAGE

[XXX][NN]–[DD] (J) — INDICATES CEILING MOUNTED JUNCTION BOX AND NUMBER

[XXX][NN]–[DD] (J) +XX AFF — INDICATES WALL MOUNTED JUNCTION BOX, NUMBER AND MOUNTING HEIGHT ABOVE FINISHED FLOOR, IF APPLICABLE

[XXX][NN]–[DD] (J) — INDICATES FLOOR MOUNTED JUNCTION BOX AND NUMBER

CABLE AND HOMERUNS

(X X) — FILL QUANTITY AND CABLE TYPE

XXXX — TERMINATION LOCATION

SHEET NOTATIONS

XX — INDICATES SHEET NOTE NUMBER

X / XXX — INDICATES DETAIL DRAWING NUMBER / INDICATES DETAIL DRAWING SHEET NUMBER

X / XXX — INDICATES ELEVATION DRAWING NUMBER / INDICATES ELEVATION DRAWING SHEET NUMBER

XX–XXX — INDICATES MATCHLINE DRAWING SHEET NUMBER

XX–XXX — INDICATES MATCHLINE DRAWING SHEET NUMBER

XX–XXX — INDICATES MATCHLINE OFF SHEET DRAWING SHEET NUMBER

XX–XXX — INDICATES MATCHLINE ACTIVE DRAWING SHEET NUMBER

X / XXX — INDICATES DETAIL DRAWING NUMBER / INDICATES DETAIL DRAWING SHEET NUMBER

DETAIL AREA BOUNDARY

SINGLE LINE SYMBOLS

GENERIC DEVICES

[XXX][NN]–[DD] — INDICATES DEVICE TYPE ABBREVIATION

XXXX — INDICATES MANUFACTURER AND MODEL NUMBER

XXXX — INDICATES BRIEF DESCRIPTION

XXXXX — XX — INDICATES OUTPUT WIRE NUMBER

XX — INDICATES OUTPUT SIGNAL TYPE

INDICATES OUTPUT CONNECTOR OR TERMINATION TYPE

XXXXX XXXXX — XX — INDICATES OUTPUT WIRE NUMBER

XX — INDICATES OUTPUT SIGNAL TYPE

INDICATES OUTPUT CONNECTOR AND/OR TERMINATION TYPE ADAPTER

NOTE: THE ABOVE INFORMATION DEPICTED FOR OUTPUTS IS ALSO TYPICAL FOR INPUTS

INDICATES PARTIAL DEVICE OR CONTINUATION

INDICATES PARTIAL DEVICE OR CONTINUATION

INDICATES AUDIO AMPLIFIER CHANNEL (INPUT AND OUTPUT CONNECTIONS NOT SHOWN)

XX XX — INDICATES FULL NORMALLED PATCHBAY

XX XX — INDICATES HALF NORMALLED PATCHBAY

XX XX — INDICATES NON NORMALLED PATCHBAY

GENERIC WIRING AND WIRING DEVICES

INDICATES WIRE BUSS OR WIRE BUNDLE

INDICATES WIRE CONNECTION

INDICATES NO WIRE CONNECTION

INDICATES TEMPORARY CONNECTION

XXXX — INDICATES TO OR FROM SYSTEMS PROVIDED BY OTHERS

INDICATES VOLUME CONTROL

SHEET NOTATIONS

(TO SHEET NUMBER) (DESTINATION ID) — INDICATES OFF SHEET FLAG: SOURCE

(FROM SHEET NUMBER) (SOURCE ID) — INDICATES OFF SHEET FLAG: DESTINATION

X — SAME SHEET FLAG

XXXX — INDICATES DEVICE LOCATION AT TOP OF SHEET

XXXX — INDICATES DEVICE LOCATION AT SIDE OF SHEET

XXXX — INDICATES EQUIPMENT ENCLOSURE

DESIGN INTENT
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client

BEVERLY HILLS
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ELECTROSONIC
DESIGN CONSULTING

ISSUE

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approved

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engineer: S. COE

drawn	created
EDC	OCTOBER 05, 2012

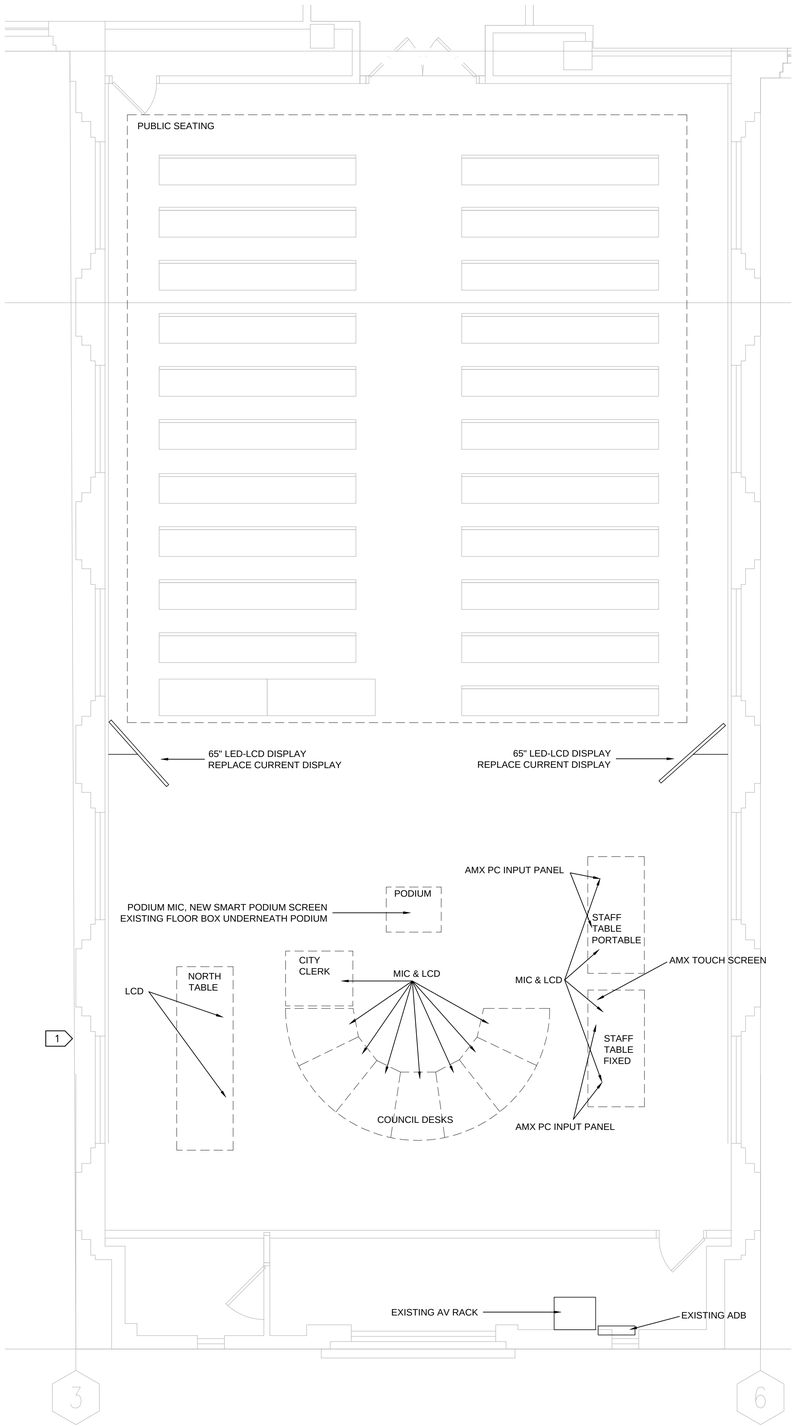
area/attraction

project: TELEVISION PRODUCTION AVC SYSTEMS UPGRADE

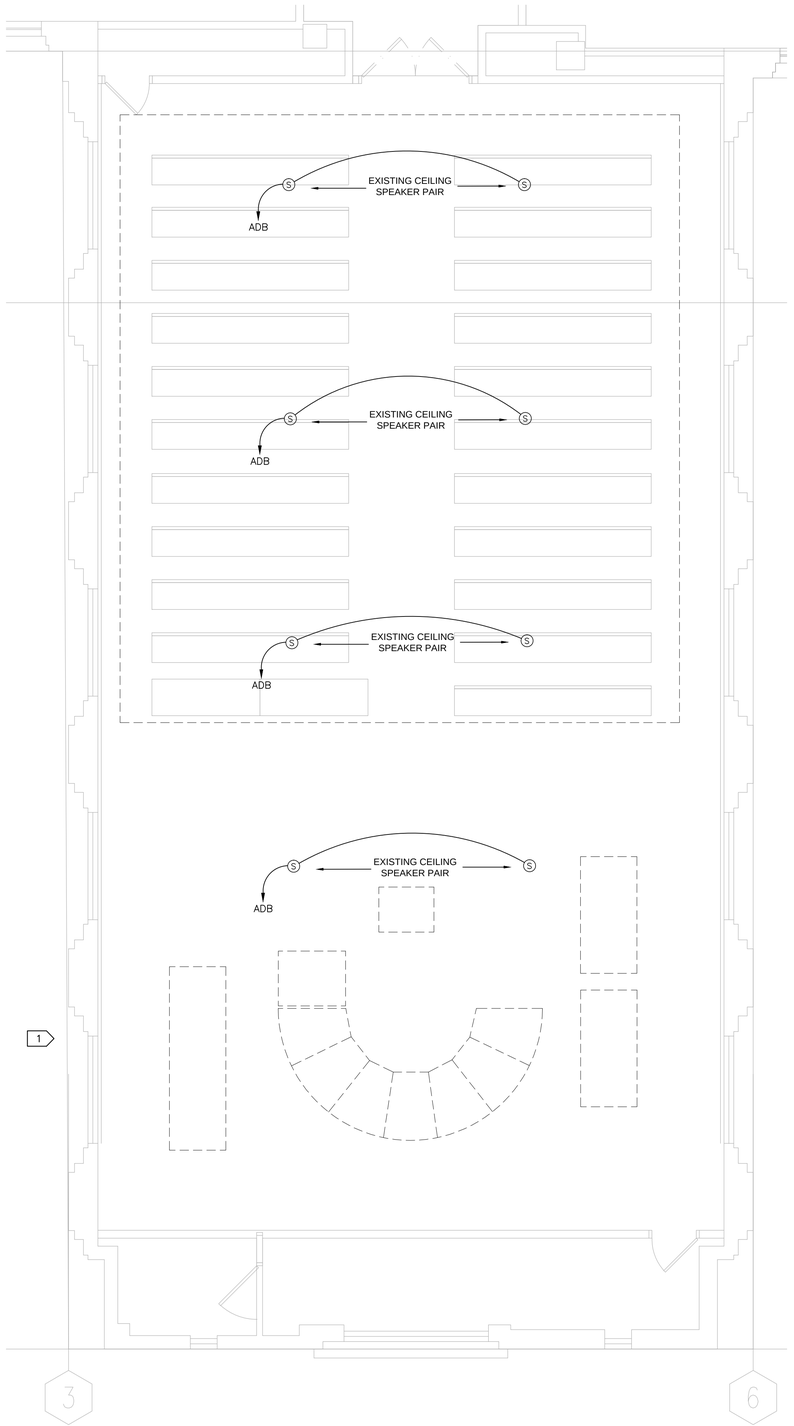
title: AV SYMBOL LEGEND

sheet no.: AV0.03

rev



1 MAIN CHAMBER AV FLOOR PLAN
SCALE: 1/4" = 1'-0"



1 MAIN CHAMBER AV REFLECTED CEILING PLAN
SCALE: 1/4" = 1'-0"

GENERAL SHEET NOTES:

- DO NOT SCALE DRAWING.

SHEET SPECIFIC NOTES:

1 ROOM LAYOUT TO BE VERIFIED BY AV CONTRACTOR - DO NOT DIMENSION FROM THIS DRAWING. COUNCIL DESKS, STAFF TABLES & EQUIPMENT ARE APPROXIMATE SKETCHES ONLY IN THIS DRAWING, AND ARE TO HELP CONVEY DESIGN INTENT ONLY.

SEE PRO-SOUND AS BUILT DRAWINGS FROM AUGUST 2001 FOR DETAILS OF PREVIOUSLY INSTALLED JUNCTION BOX AND CONDUIT/CABLE RUNS, WHICH ARE TO BE RE-USED. AV CONTRACTOR SHALL PERFORM THEIR OWN SITE SURVEY.

DESIGN INTENT
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project no. DEC100167 | cad file | scale 1/4" = 1'-0"

engineer
S. COE

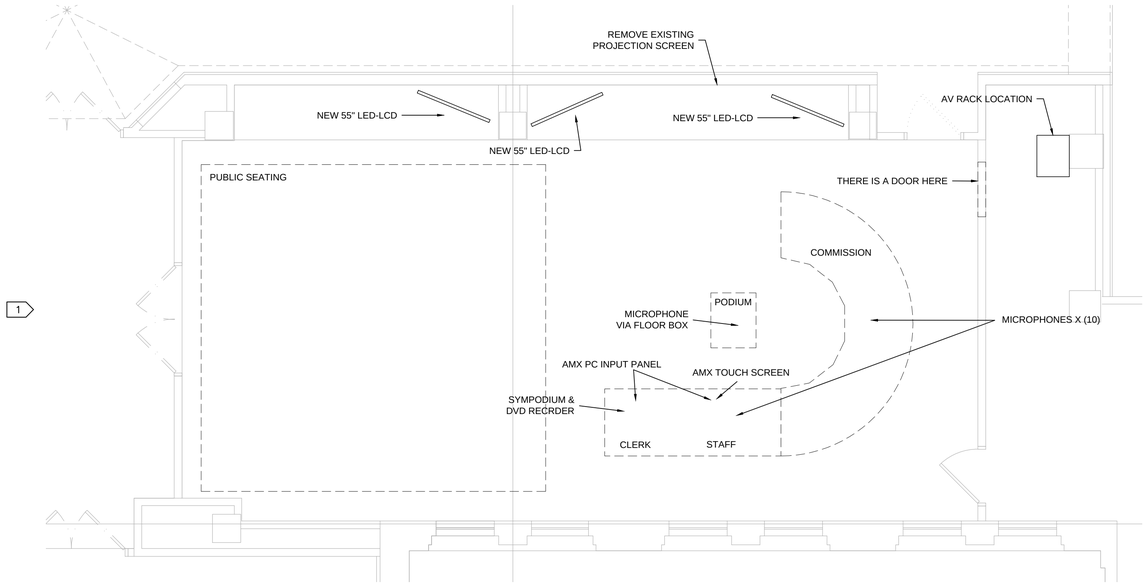
drawn EDC | created

area/attraction
COUNCIL CHAMBERS

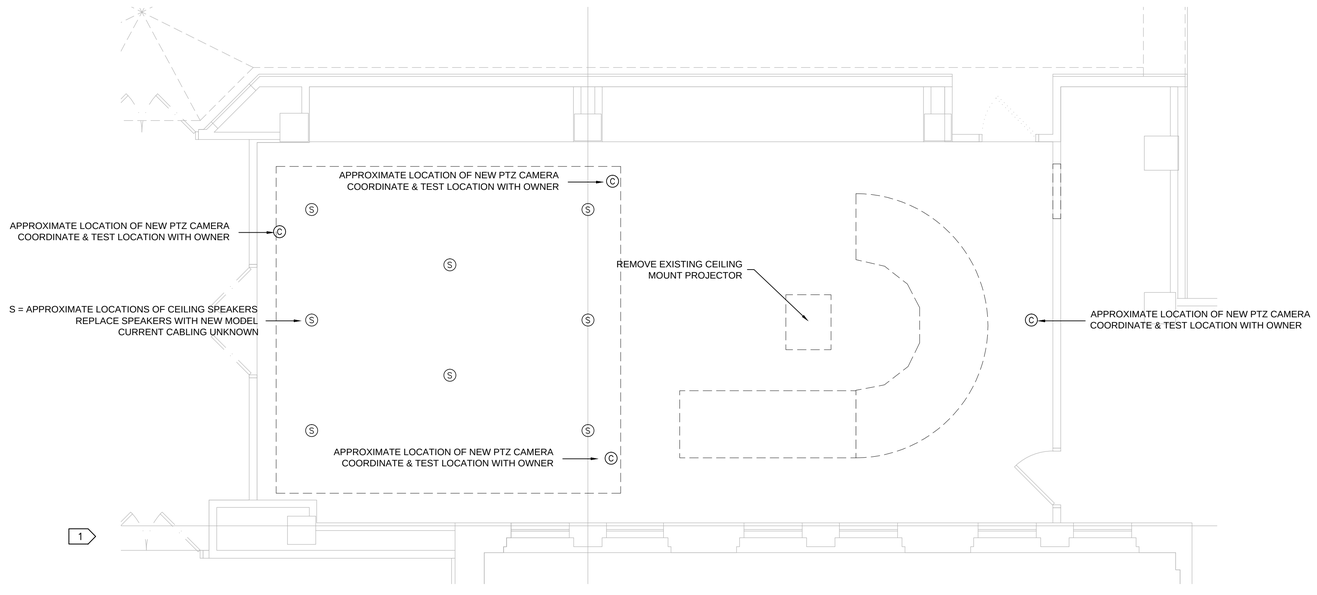
project
TELEVISION PRODUCTION
AVC SYSTEMS UPGRADE

title
AV PLANS

sheet no. AV1.01 | rev



1 ROOM A AV FLOOR PLAN
SCALE: 1/4" = 1'-0"



1 ROOM A AV REFLECTED CEILING PLAN
SCALE: 1/4" = 1'-0"

GENERAL SHEET NOTES:

- DO NOT SCALE DRAWING.

SHEET SPECIFIC NOTES:

1 ROOM LAYOUT TO BE VERIFIED BY AV CONTRACTOR - DO NOT DIMENSION FROM THIS DRAWING. COMMISSION DESKS, STAFF TABLES & EQUIPMENT ARE APPROXIMATE SKETCHES ONLY IN THIS DRAWING, AND ARE TO HELP CONVEY DESIGN INTENT ONLY.

NO AS BUILT DRAWINGS WERE AVAILABLE AT THE TIME OF THIS DESIGN FOR DETAILS OF PREVIOUSLY INSTALLED JUNCTION BOX AND CONDUIT/CABLE RUNS, WHICH ARE TO BE RE-USED. AV CONTRACTOR SHALL PERFORM THEIR OWN SITE SURVEY.

DESIGN INTENT
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client

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ELECTROSONIC
DESIGN CONSULTING

ISSUE
description
DESIGN INTENT
date
OCT 15, 2012
approved

REVISIONS

rev	date	description

project no.	cad file	scale
DEC100167		1/4" = 1'-0"

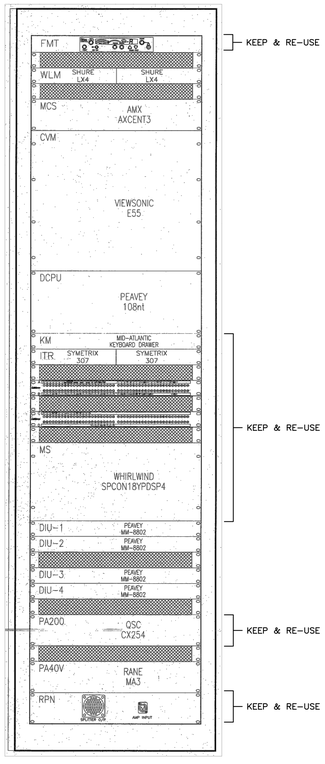
engineer
S. COE
drawn
created
EDC
area/attraction

ROOM A
project

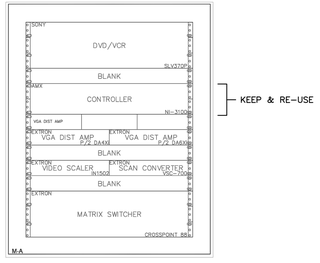
TELEVISION PRODUCTION
AVC SYSTEMS UPGRADE
title

AV PLANS

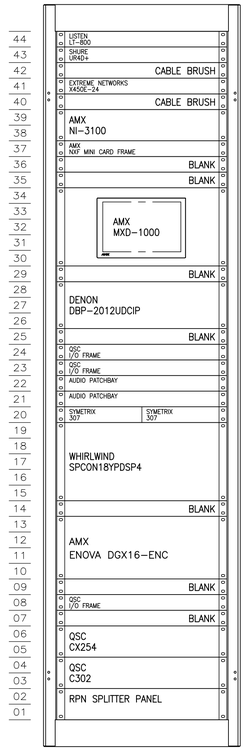
sheet no. AV1.02
rev



EXISTING RACK AS BUILT DRAWING
AUGUST 2001
AV CONTRACTOR TO VERIFY. THIS RACK
ENCLOSURE TO BE RE-USED



EXISTING RACK AS BUILT DRAWING
AUGUST 2006
AV CONTRACTOR TO VERIFY. THIS RACK
TO BE REMOVED



NEW SUGGESTED RACK LAYOUT – AV
CONTRACTOR TO VERIFY

MAIN CHAMBER AV RACK ROOM
RACK ELEVATIONS

DESIGN INTENT
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engineer
S. COE

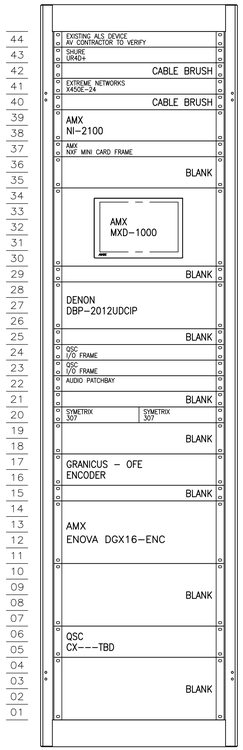
drawn EDC | created OCTOBER 05, 2012

area/attraction
MAIN CHAMBER
AV RACK ROOM

project
TELEVISION PRODUCTION
AVC SYSTEMS UPGRADE

title
AV EQUIPMENT RACK
ELEVATIONS

sheet no. AV5.01 | rev



AV RACK
MIDDLE ATLANTIC
MRK4431
FRONT ELEVATION

NEW SUGGESTED RACK LAYOUT – AV CONTRACTOR TO VERIFY. ASSISTED LISTENING DEVICE IN CURRENT RACK TO BE RE-USED. CURRENT AS BUILT RACK DRAWINGS NOT AVAILABLE AT TIME OF THIS DESIGN

ROOM A AV RACK ROOM
RACK ELEVATION

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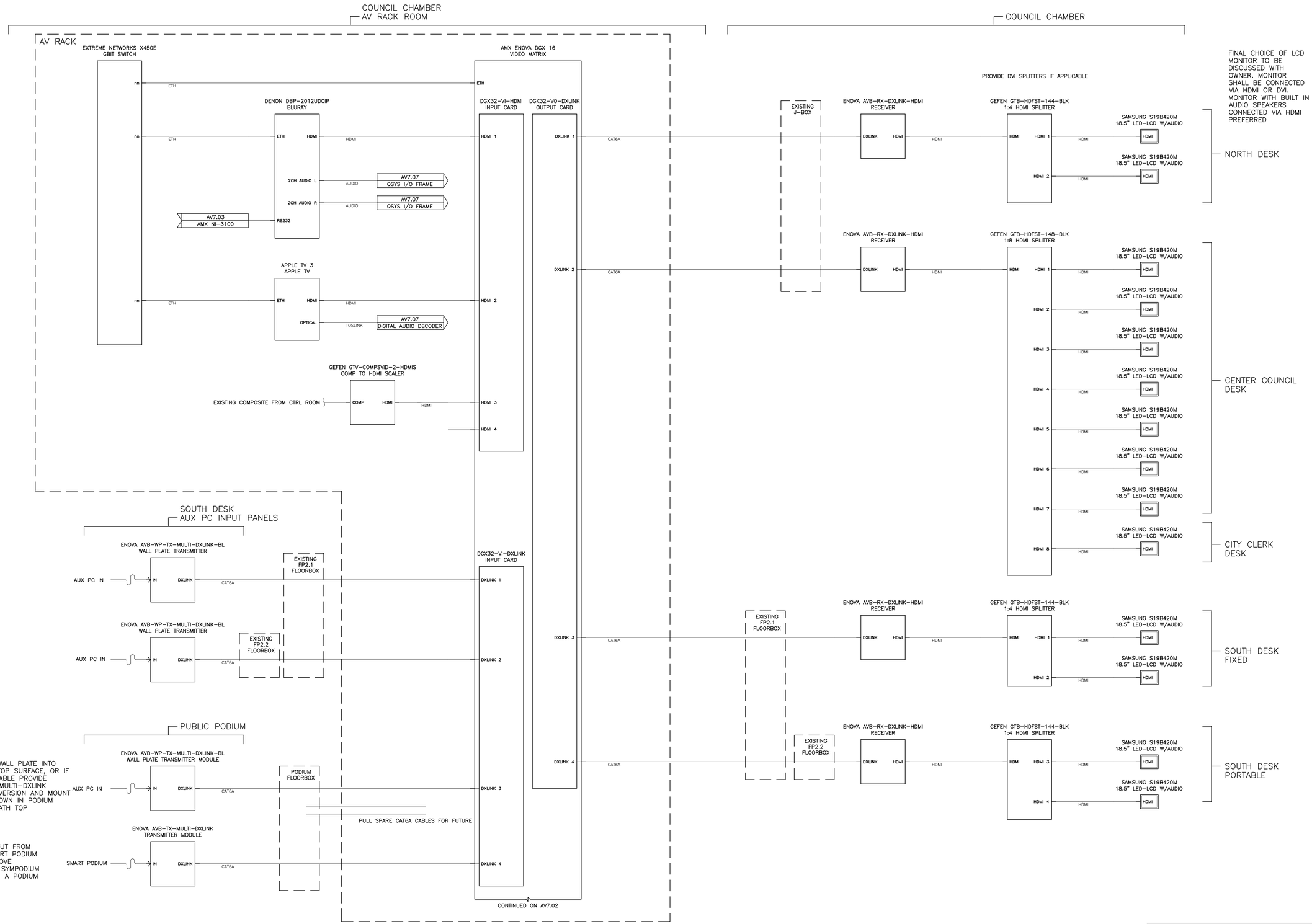
engineer: S. COE
drawn: EDC
created: OCTOBER 05, 2012
area/attraction: ROOM A AV RACK ROOM
project: TELEVISION PRODUCTION AVC SYSTEMS UPGRADE
title: AV EQUIPMENT RACK ELEVATIONS

sheet no.	rev
AV5.02	



COUNCIL CHAMBER VIDEO

DESIGN INTENT
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engineer
S. COE

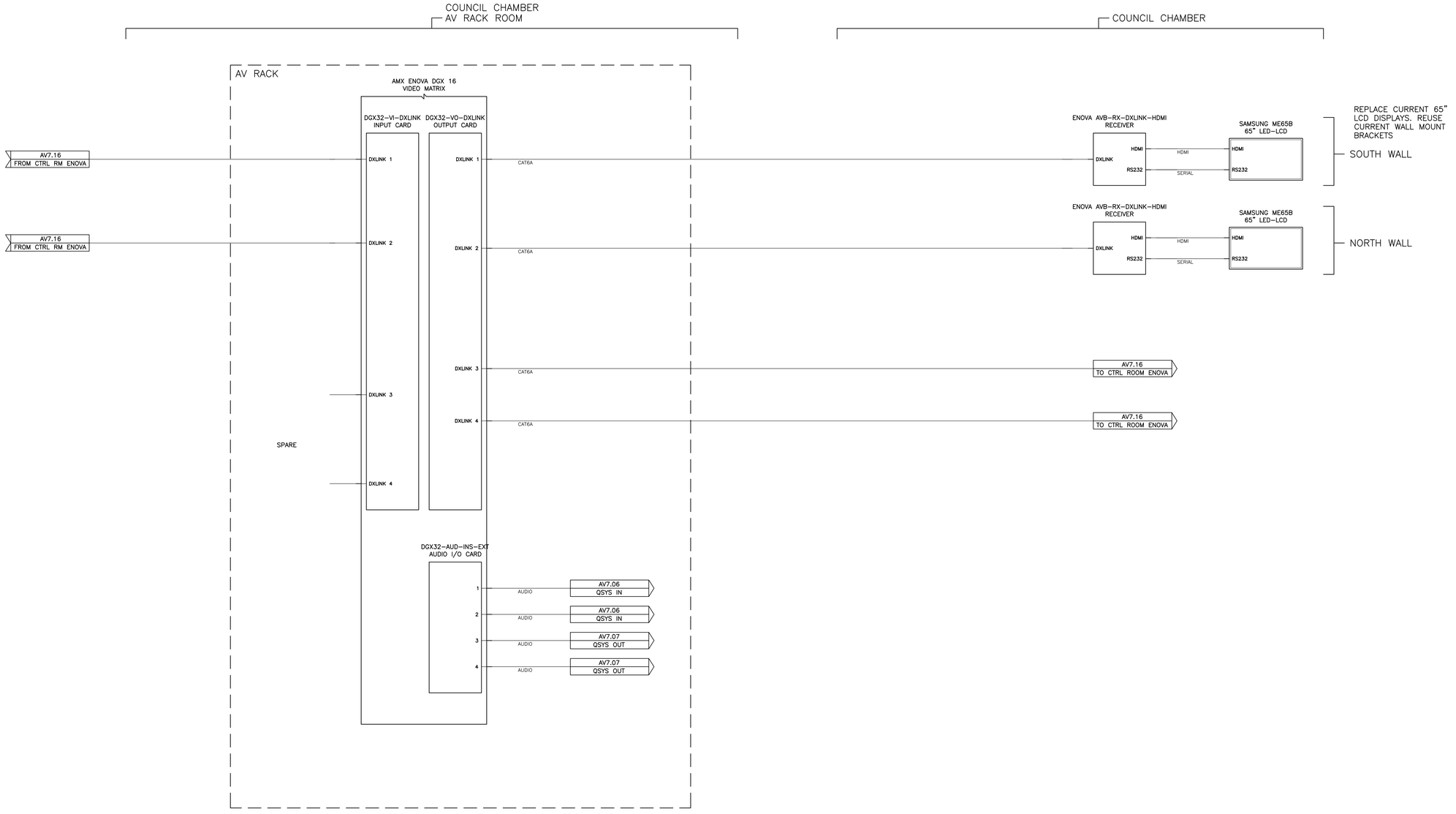
drawn EDC | created OCTOBER 05, 2012

area/attraction
OVERALL

project
TELEVISION PRODUCTION AVC SYSTEMS UPGRADE

title
AV SINGLE LINE BLOCK DIAGRAM

sheet no. AV7.01 | rev



COUNCIL CHAMBER VIDEO

DESIGN INTENT
NOT FOR CONSTRUCTION

client

BEVERLY HILLS
CITY HALL
455 N. REXFORD DRIVE
BEVERLY HILLS, CA 90210

ELECTROSONIC
DESIGN CONSULTING

ISSUE

description: DESIGN INTENT

date: OCT 15, 2012

approved:

REVISIONS

rev	date	description

project no.: DEC100167 | cad file: | scale: NONE

engineer: S. COE

drawn: EDC | created: OCTOBER 05, 2012

area/attraction: OVERALL

project: TELEVISION PRODUCTION AVC SYSTEMS UPGRADE

title: AV SINGLE LINE BLOCK DIAGRAM

sheet no.: AV7.02 | rev:

COUNCIL CHAMBER
AV RACK ROOM

COUNCIL CHAMBER

AV RACK

EXTREME NETWORKS X450E
GBIT SWITCH

OFE – EXISTING
AMX NI–3100
CONTROLLER

MOVE AMX NI–3100
FROM SMALL RACK TO
LARGE RACK

CAT6A — ETH — RS232 — SERIAL — AV7.01 DENON DVD PLAYER

RELAY 1 — CTRL — TO PODIUM CTRL LIFT UP
RELAY 2 — CTRL — TO PODIUM CTRL LIFT DOWN
AXLINK — AXLINK — TO AXD–MSP8 LIGHTING CONTROL

EXISTING CONNECTIONS

AV CONTRACTOR TO INVESTIGATE WETHER IT IS POSSIBLE TO REPLACE EXISTING AXLINK CABLE TO AMX MSP8 WITH CAT6 IN ORDER TO PROVIDE UPGRDE PATH FROM MSP8 WALL CONTROLLER TO SMALL AMX TOUCH SCREEN IN THE FUTURE. ALL CURRENT AMC CONTROL FUNCTIONS TO THE PODIUM AND LIGHTING SHALL BE MAINTAINED

CAT6A — AMX MXD–1000 10.1" TOUCH SCREEN (ETH) — MOUNTED ON RACK PANEL

CAT6A — EXTREME NETWORKS ALTITUDE WAP (ETH) — REPLACE CURRENT WAP

CAT6A — EXISTING FP2.1 FLOORBOX — CUSTOM CONNECTOR PANEL (ETH) — AMX MXT–1000 10.1" TOUCH SCREEN (ETH) — SOUTH DESK FIXED

CAT6A — EXISTING J–BOX — CUSTOM CONNECTOR PANEL (ETH) — CITY CLERK DESK

PROVIDE ALTERNATE CONNECTION POINT FOR AMX TOUCH SCREEN

CAT6A — AV7.04 AMX NXF–MINI
CAT6A — AV7.06 SHURE UR4D+
CAT6A — AV7.05 QSYS I/O FRAME
CAT6A — AV7.06 QSYS I/O FRAME
CAT6A — AV7.07 QSYS I/O FRAME

CAT6A — AV7.15 CTRL ROOM SWITCH
CAT6A — AV7.10 ROOM A SWITCH

COUNCIL CHAMBER CONTROL

DESIGN INTENT
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client

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BEVERLY HILLS, CA 90210

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project no.	cad file	scale
DEC100167		NONE

engineer: S. COE
drawn: EDC
created: OCTOBER 05, 2012
area/attraction: OVERALL
project: TELEVISION PRODUCTION AVC SYSTEMS UPGRADE
title: AV SINGLE LINE BLOCK DIAGRAM

sheet no.: AV7.03
rev:

COUNCIL CHAMBER
AV RACK ROOM

AV RACK

AV7.03
FROM SWITCH

AMX NXF-MINI
CARD FRAME

ETH

AMX NXC-I/O10
I/O CARD

1 CTRL — AV7.05 MIC PANEL CTRL BUTTON
2 CTRL — AV7.05 MIC PANEL CTRL BUTTON
3 CTRL — AV7.05 MIC PANEL CTRL BUTTON
4 CTRL — AV7.05 MIC PANEL CTRL BUTTON
5 CTRL — AV7.05 MIC PANEL CTRL BUTTON
6 CTRL — AV7.05 MIC PANEL CTRL BUTTON
7 CTRL — AV7.05 MIC PANEL CTRL BUTTON
8 CTRL — AV7.05 MIC PANEL CTRL BUTTON
9 CTRL — AV7.05 MIC PANEL CTRL BUTTON
10 CTRL — AV7.05 MIC PANEL CTRL BUTTON

AMX NXC-I/O10
I/O CARD

1 CTRL — AV7.05 MIC PANEL CTRL BUTTON
2 CTRL — AV7.05 MIC PANEL CTRL BUTTON
3 CTRL — AV7.05 MIC PANEL CTRL BUTTON
4 CTRL
5 CTRL
6 CTRL
7 CTRL
8 CTRL
9 CTRL
10 CTRL

SPARE

AMX NXC-REL10
RELAY CARD

1 CTRL — AV7.05 MIC PANEL STAT LED
2 CTRL — AV7.05 MIC PANEL STAT LED
3 CTRL — AV7.05 MIC PANEL STAT LED
4 CTRL — AV7.05 MIC PANEL STAT LED
5 CTRL — AV7.05 MIC PANEL STAT LED
6 CTRL — AV7.05 MIC PANEL STAT LED
7 CTRL — AV7.05 MIC PANEL STAT LED
8 CTRL — AV7.05 MIC PANEL STAT LED
9 CTRL — AV7.05 MIC PANEL STAT LED
10 CTRL — AV7.05 MIC PANEL STAT LED

AMX NXC-REL10
RELAY CARD

1 CTRL — AV7.05 MIC PANEL STAT LED
2 CTRL — AV7.05 MIC PANEL STAT LED
3 CTRL — AV7.05 MIC PANEL STAT LED
4 CTRL — AV7.05 MIC PANEL STAT LED
5 CTRL
6 CTRL
7 CTRL
8 CTRL
9 CTRL
10 CTRL

SPARE

EXISTING ADB

COUNCIL CHAMBER

COUNCIL CHAMBER CONTROL

DESIGN INTENT
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client

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CITY HALL
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ELECTROSONIC
DESIGN CONSULTING

ISSUE

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DESIGN INTENT

date
OCT 15, 2012

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REVISIONS

rev	date	description

project no.	cad file	scale
DEC100167		NONE

engineer
S. COE

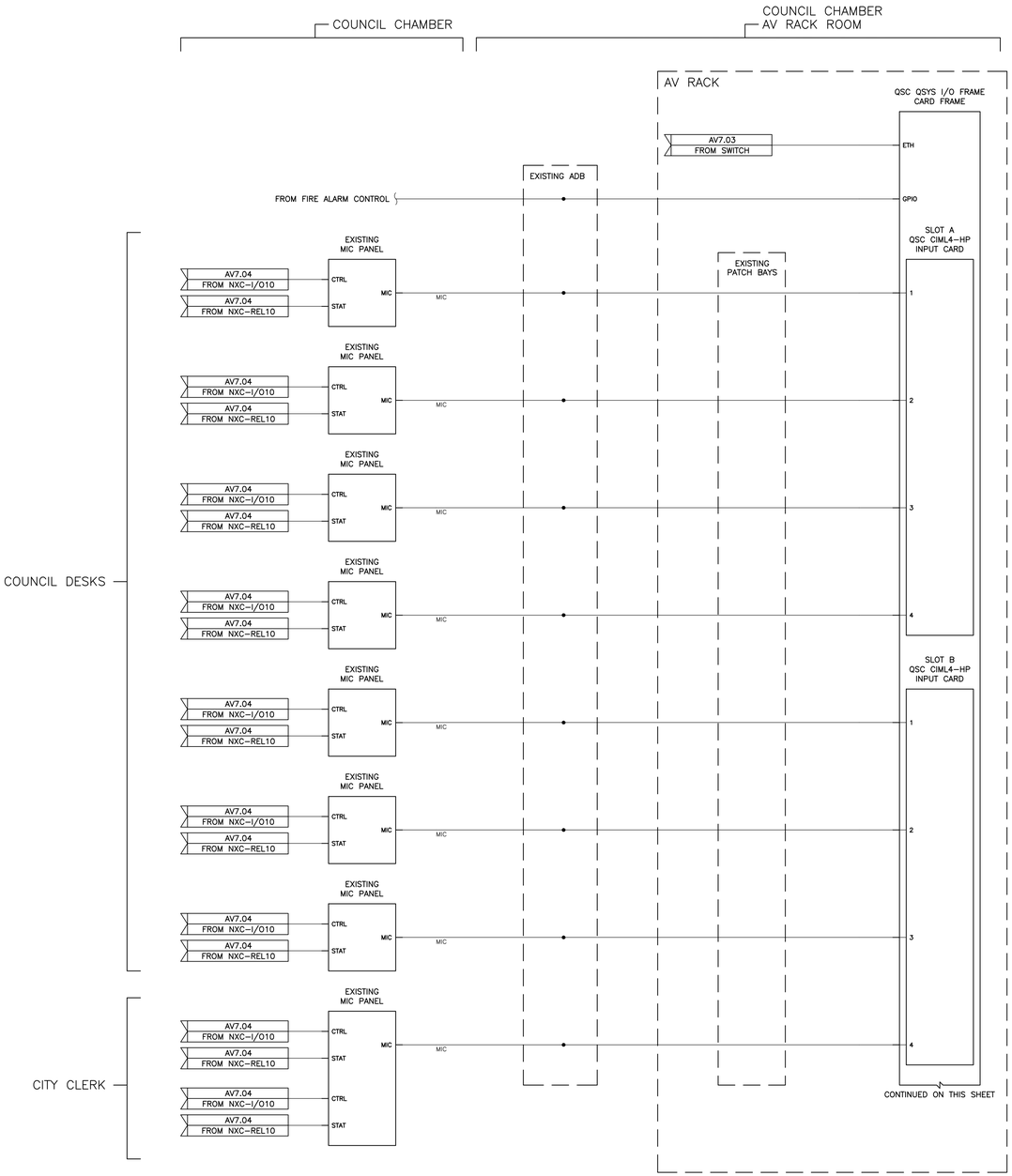
drawn	created
EDC	OCTOBER 05, 2012

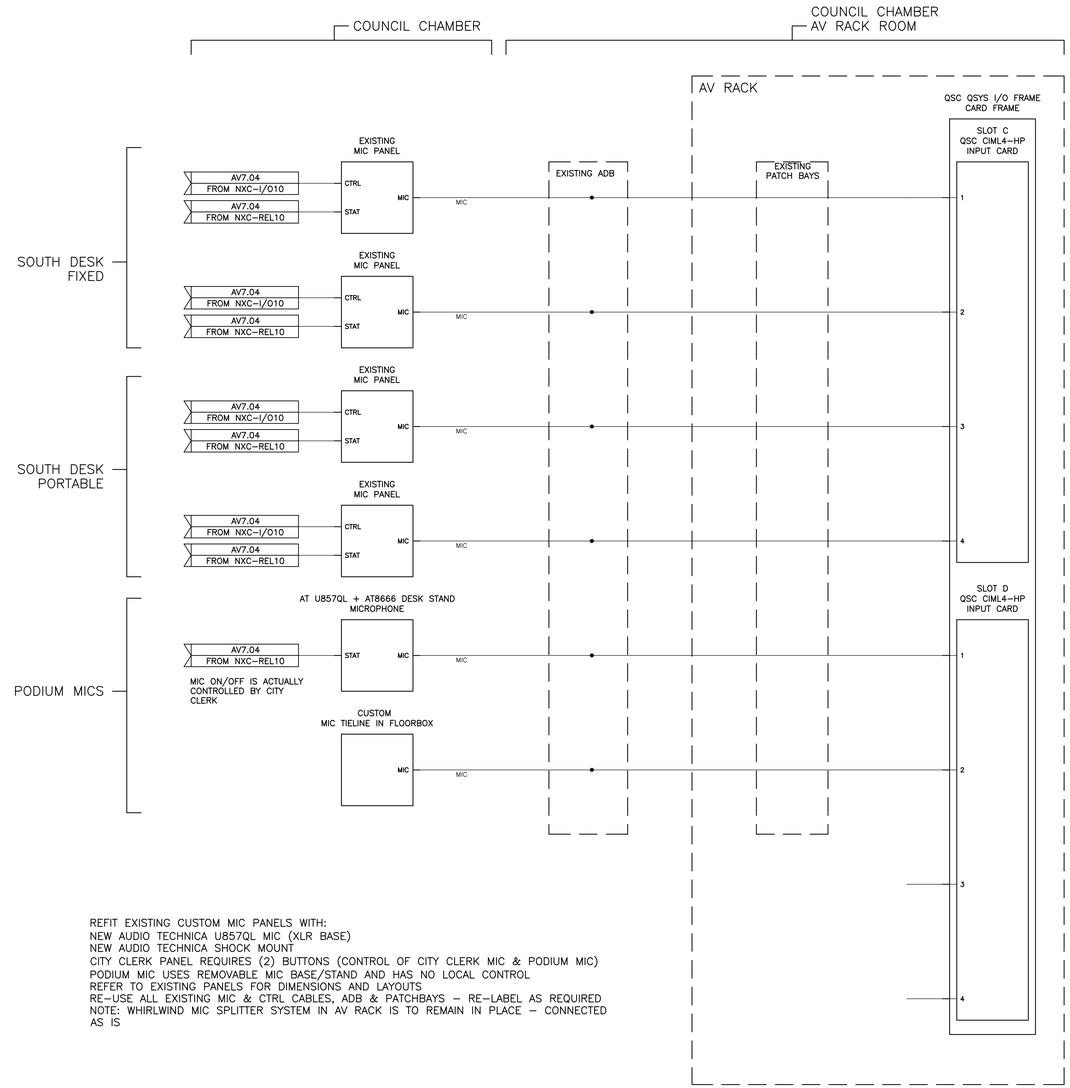
area/attraction
OVERALL

project
TELEVISION PRODUCTION
AVC SYSTEMS UPGRADE

title
AV SINGLE LINE
BLOCK DIAGRAM

sheet no.	rev
AV7.04	





REFIT EXISTING CUSTOM MIC PANELS WITH:
NEW AUDIO TECHNICA U857QL MIC (XLR BASE)
NEW AUDIO TECHNICA SHOCK MOUNT
CITY CLERK PANEL REQUIRES (2) BUTTONS (CONTROL OF CITY CLERK MIC & PODIUM MIC)
PODIUM MIC USES REMOVABLE MIC BASE/STAND AND HAS NO LOCAL CONTROL
REFER TO EXISTING PANELS FOR DIMENSIONS AND LAYOUTS
RE-USE ALL EXISTING MIC & CTRL CABLES, ADB & PATCHBAYS – RE-LABEL AS REQUIRED
NOTE: WHIRLWIND MIC SPLITTER SYSTEM IN AV RACK IS TO REMAIN IN PLACE – CONNECTED AS IS

COUNCIL CHAMBER AUDIO

DESIGN INTENT
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CITY HALL
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BEVERLY HILLS, CA 90210

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ISSUE

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DESIGN INTENT

date
OCT 15, 2012

approved

REVISIONS

rev	date	description

project no.	cad file	scale
DEC100167		NONE

engineer
S. COE

drawn	created
EDC	OCTOBER 05, 2012

area/attraction

OVERALL

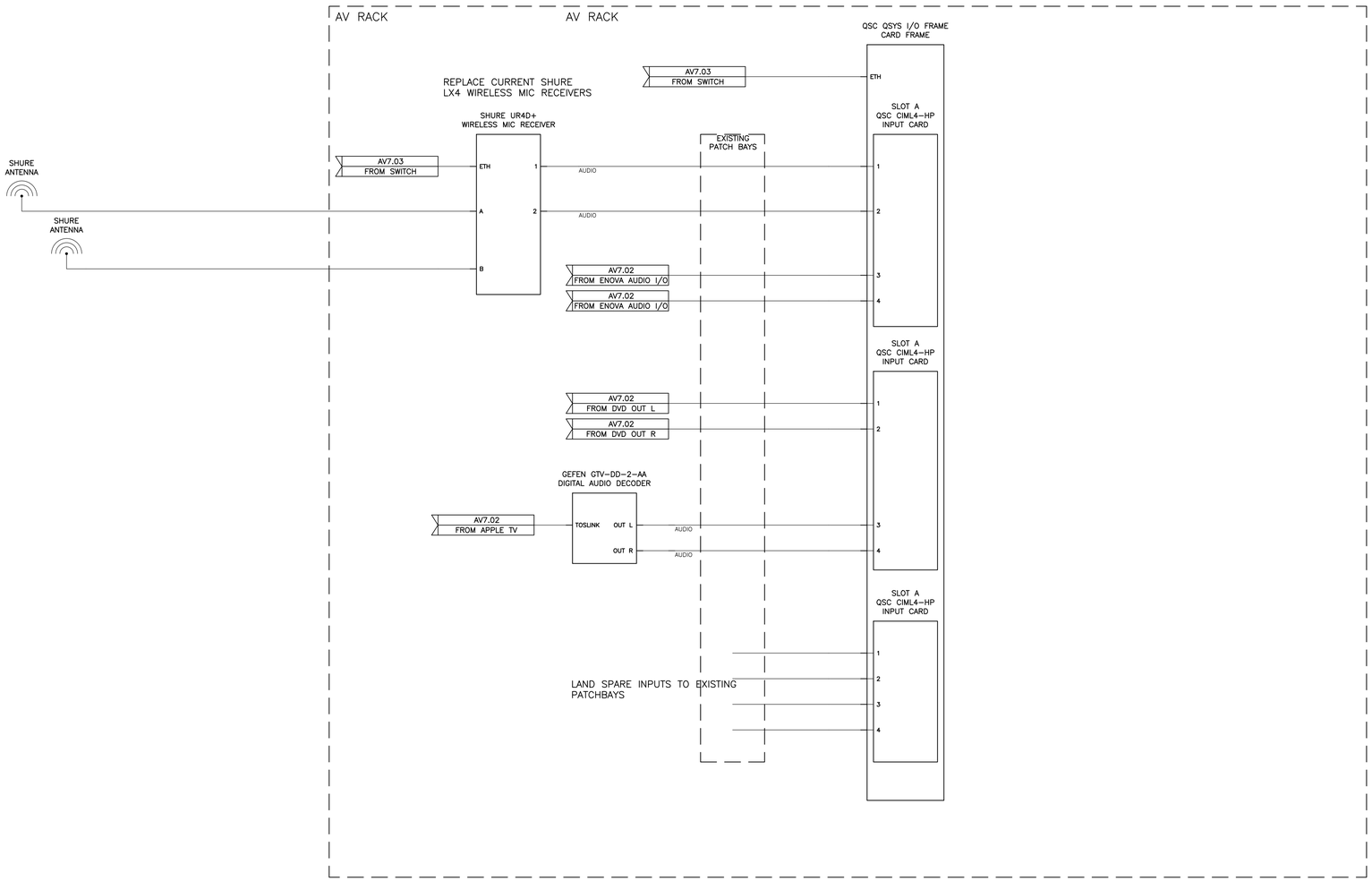
project
TELEVISION PRODUCTION
AVC SYSTEMS UPGRADE

title
AV SINGLE LINE
BLOCK DIAGRAM

sheet no.	rev
AV7.05	

COUNCIL CHAMBER

COUNCIL CHAMBER
AV RACK ROOM



COUNCIL CHAMBER AUDIO

DESIGN INTENT
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BEVERLY HILLS
CITY HALL
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ELECTROSONIC
DESIGN CONSULTING

ISSUE

description
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date
OCT 15, 2012

approved

REVISIONS

rev	date	description

project no. DEC100167 | cad file | scale NONE

engineer
S. COE

drawn EDC | created OCTOBER 05, 2012

area/attraction
OVERALL

project
TELEVISION PRODUCTION
AVC SYSTEMS UPGRADE

title
AV SINGLE LINE
BLOCK DIAGRAM

sheet no. AV7.06 | rev

COUNCIL CHAMBER
AV RACK ROOM

COUNCIL CHAMBER

AV RACK

QSC QSYS I/O FRAME
CARD FRAME

AV7.03
FROM SWITCH

ETH

SLOT A
QSC COL4
OUTPUT CARD

1 AUDIO
2 AUDIO
3 AUDIO
4 AUDIO

RE-USE CURRENT LISTEN TECHNOLOGIES
LT-800 ASSISTED LISTENING SYSTEM (ALS)

EXISTING
PATCH BAYS

LISTEN LT-800
EXISTING ALS TRANSMITTER

AUDIO IN ANT

RF

LISTEN
ALS ANTENNA

AV7.02
TO ENOVA AUDIO I/O

AV7.02
TO ENOVA AUDIO I/O

LAND SPARE OUTPUTS TO EXISTING
PATCHBAYS

SLOT B
QSC COL4
OUTPUT CARD

1 AUDIO
2 AUDIO
3 AUDIO
4 AUDIO

SLOT C
QSC CODP4
DATAPORT CARD

DP1 DATAPORT
DP2 DATAPORT

RE-USE EXISTING QSC CX-254,
REMOVE RANE MA3 AND
REPLACE WITH NEW QSC CX302.
QSC DATAPORT CONNECTIONS
SHALL BE USED ON BOTH
AMPLIFIERS

QSC CX254
EXISTING AMPLIFIER

DP1
DP2

1 SPKR
2 SPKR
3 SPKR
4 SPKR

EXISTING
ADB

EXISTING SPEAKERS

TANNOY S8iw
EXISTING CEILING SPEAKER

CEILING
FRONT

CEILING
MID FRONT

CEILING
MID REAR

CEILING
REAR

QSC CX302
AMPLIFIER

QSC IT-42
70V MODULE

SLOT D
QSC CODP4
DATAPORT CARD

DP1 DATAPORT

DP1
2 SPKR

ATLAS FA114T72
EXISTING 70V SPEAKER

QTY (7)

COUNCIL TABLE

SOUTH TABLE

EXISTING
FP2.1
FLOORBOX

EXISTING
FP2.2
FLOORBOX

CUSTOM
SPEAKER CONNECTION PANEL

SOUTH TABLE
PORTABLE

COUNCIL CHAMBER AUDIO

DESIGN INTENT
NOT FOR CONSTRUCTION

client

BEVERLY HILLS
CITY HALL
455 N. REXFORD DRIVE
BEVERLY HILLS, CA 90210

ELECTROSONIC
DESIGN CONSULTING

ISSUE
description
DESIGN INTENT
date
OCT 15, 2012
approved

REVISIONS

rev	date	description

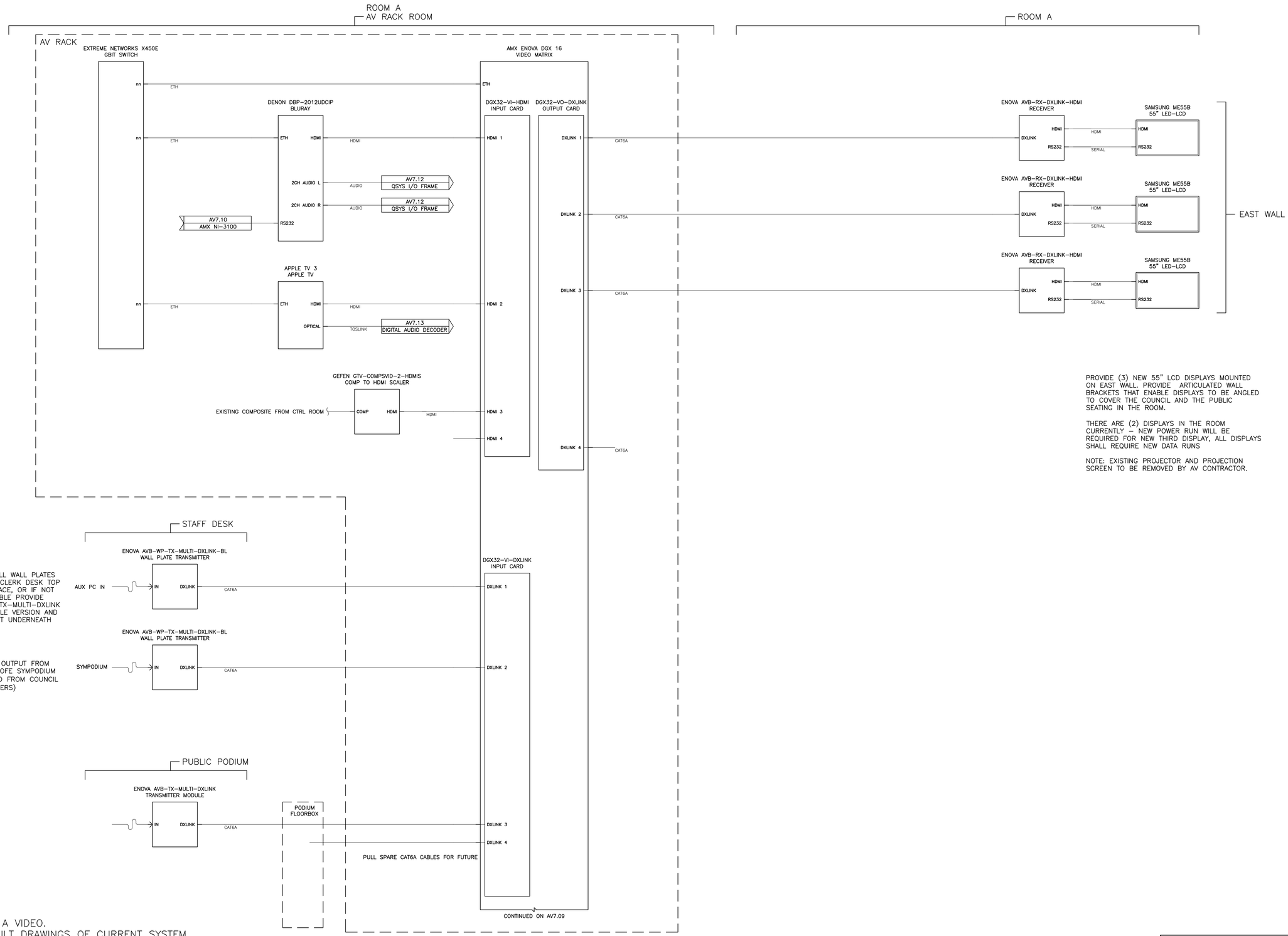
project no. DEC100167 | cad file | scale NONE
engineer
S. COE
drawn | created
EDC | OCTOBER 05, 2012
area/attraction

OVERALL

project
TELEVISION PRODUCTION
AVC SYSTEMS UPGRADE

title
AV SINGLE LINE
BLOCK DIAGRAM

sheet no. AV7.07 | rev



PROVIDE (3) NEW 55" LCD DISPLAYS MOUNTED ON EAST WALL. PROVIDE ARTICULATED WALL BRACKETS THAT ENABLE DISPLAYS TO BE ANGLED TO COVER THE COUNCIL AND THE PUBLIC SEATING IN THE ROOM.

THERE ARE (2) DISPLAYS IN THE ROOM CURRENTLY – NEW POWER RUN WILL BE REQUIRED FOR NEW THIRD DISPLAY, ALL DISPLAYS SHALL REQUIRE NEW DATA RUNS

NOTE: EXISTING PROJECTOR AND PROJECTION SCREEN TO BE REMOVED BY AV CONTRACTOR.

ROOM A VIDEO.
AS BUILT DRAWINGS OF CURRENT SYSTEM NOT AVAILABLE AT TIME OF THIS DESIGN

DESIGN INTENT
NOT FOR CONSTRUCTION

client

BEVERLY HILLS
CITY HALL
455 N. REXFORD DRIVE
BEVERLY HILLS, CA 90210

ELECTROSONIC
DESIGN CONSULTING

ISSUE

description: DESIGN INTENT

date: OCT 15, 2012

approved:

REVISIONS

rev	date	description

project no.	cad file	scale
DEC100167		NONE

engineer: S. COE

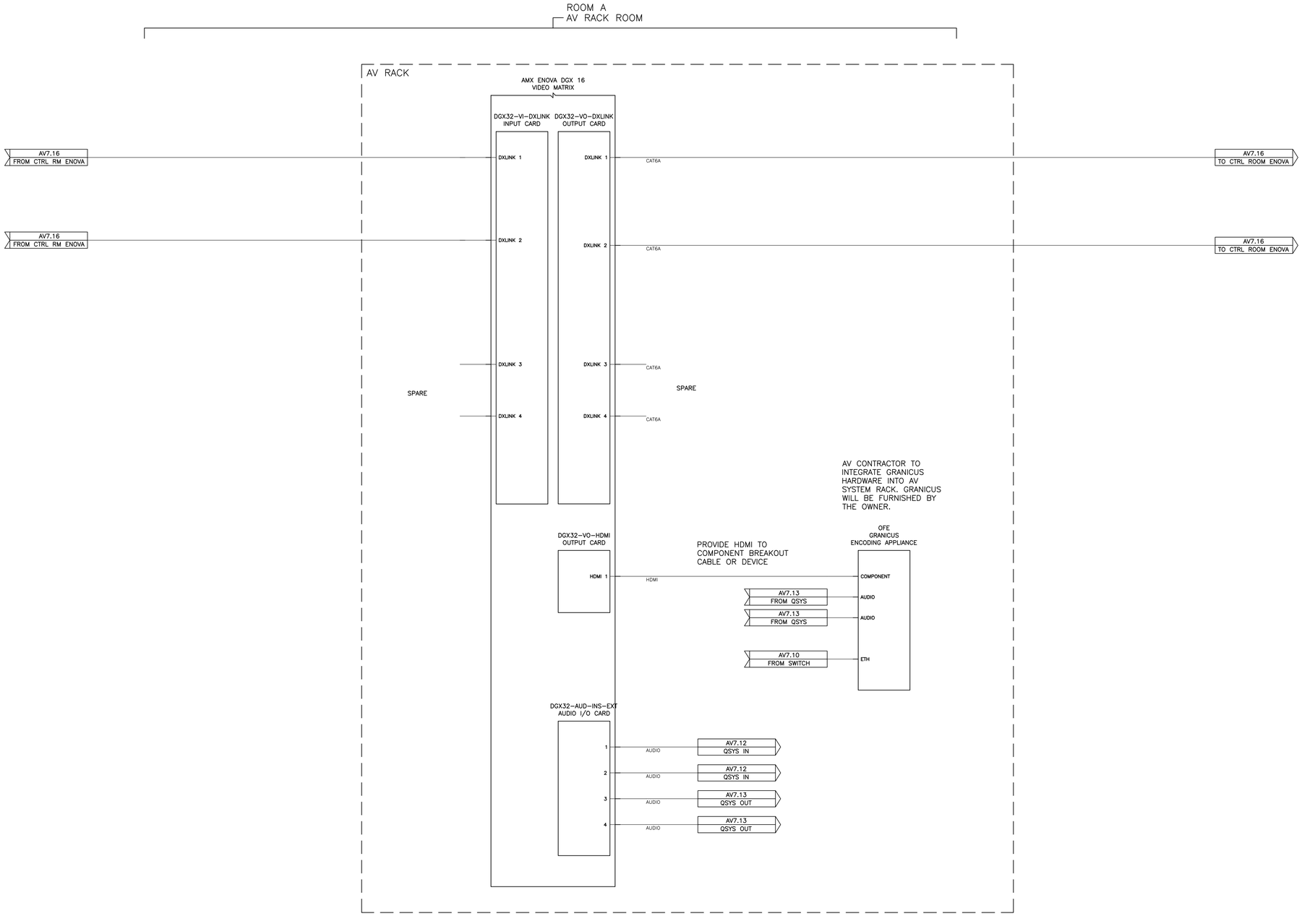
drawn	created
EDC	OCTOBER 05, 2012

area/attraction: OVERALL

project: TELEVISION PRODUCTION AVC SYSTEMS UPGRADE

title: AV SINGLE LINE BLOCK DIAGRAM

sheet no.	rev
AV7.08	



ROOM A VIDEO.
AS BUILT DRAWINGS OF CURRENT SYSTEM
NOT AVAILABLE AT TIME OF THIS DESIGN

DESIGN INTENT
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client

BEVERLY HILLS
CITY HALL
455 N. REXFORD DRIVE
BEVERLY HILLS, CA 90210

ELECTROSONIC
DESIGN CONSULTING

ISSUE

description
DESIGN INTENT

date
OCT 15, 2012

approved

REVISIONS

rev	date	description

project no.	cad file	scale
DEC100167		NONE

engineer
S. COE

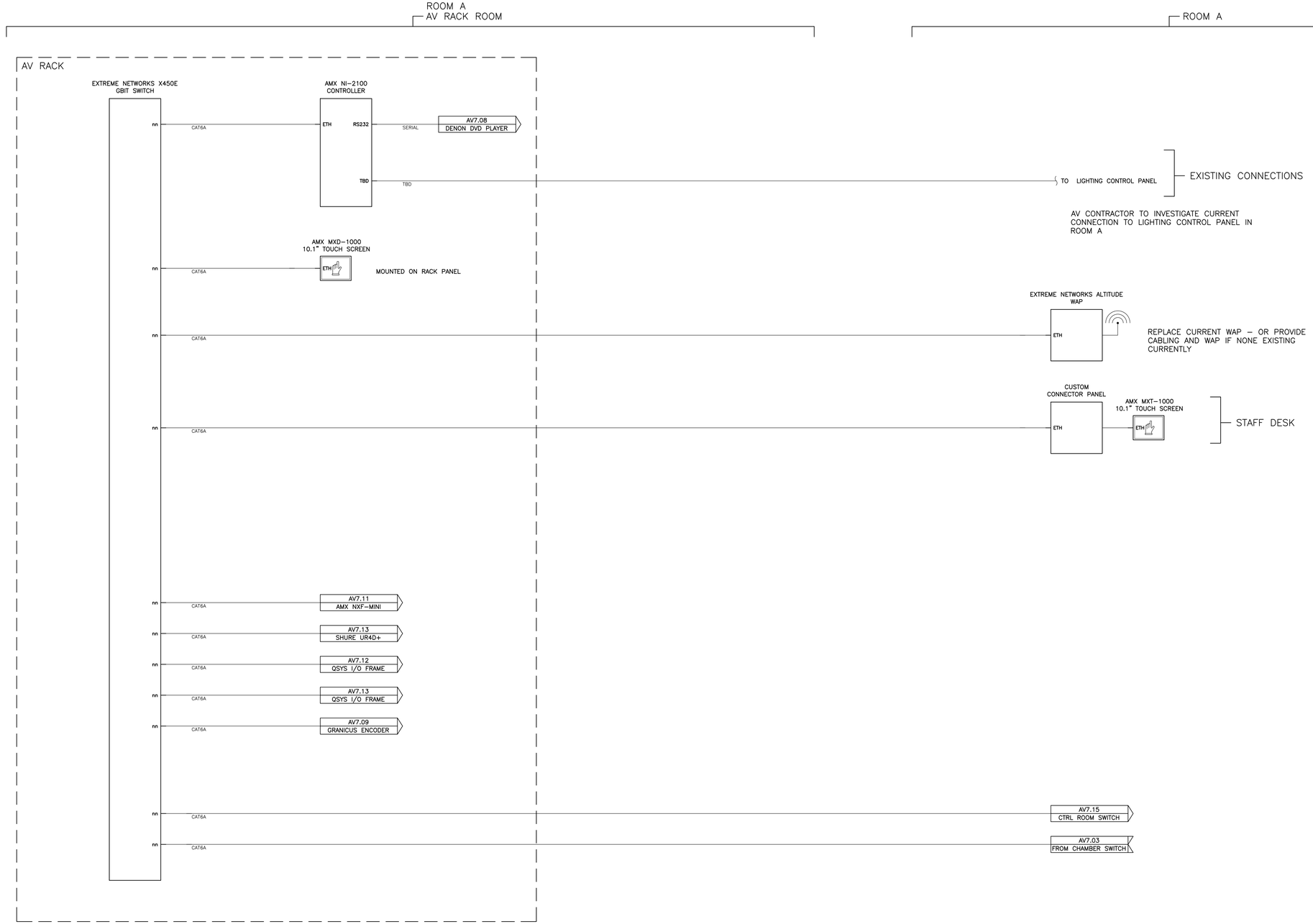
drawn | created
EDC | OCTOBER 05, 2012

area/attraction
OVERALL

project
TELEVISION PRODUCTION
AVC SYSTEMS UPGRADE

title
AV SINGLE LINE
BLOCK DIAGRAM

sheet no. | rev
AV7.09 |



ROOM A CONTROL.
AS BUILT DRAWINGS OF CURRENT SYSTEM NOT AVAILABLE AT TIME OF THIS DESIGN

DESIGN INTENT
NOT FOR CONSTRUCTION

client

BEVERLY HILLS
CITY HALL
455 N. REXFORD DRIVE
BEVERLY HILLS, CA 90210

ELECTROSONIC
DESIGN CONSULTING

ISSUE
description: DESIGN INTENT
date: OCT 15, 2012
approved:

REVISIONS

rev	date	description

project no.: DEC100167
cad file:
scale: NONE
engineer: S. COE
drawn:
created: OCTOBER 05, 2012
area/attraction: EDC

OVERALL

project
TELEVISION PRODUCTION
AVC SYSTEMS UPGRADE

title
AV SINGLE LINE
BLOCK DIAGRAM

sheet no.: AV7.10
rev:

ROOM A
AV RACK ROOM

AV RACK

AV7.10
FROM SWITCH

AMX NXF-MINI
CARD FRAME

ETH

AMX NXC-I/O10
I/O CARD

1	CTRL	AV7.12 MIC PANEL CTRL BUTTON
2	CTRL	AV7.12 MIC PANEL CTRL BUTTON
3	CTRL	AV7.12 MIC PANEL CTRL BUTTON
4	CTRL	AV7.12 MIC PANEL CTRL BUTTON
5	CTRL	AV7.12 MIC PANEL CTRL BUTTON
6	CTRL	AV7.12 MIC PANEL CTRL BUTTON
7	CTRL	AV7.12 MIC PANEL CTRL BUTTON
8	CTRL	AV7.12 MIC PANEL CTRL BUTTON
9	CTRL	AV7.12 MIC PANEL CTRL BUTTON
10	CTRL	AV7.12 MIC PANEL CTRL BUTTON

AMX NXC-I/O10
I/O CARD

1	CTRL	AV7.12 MIC PANEL CTRL BUTTON
2	CTRL	
3	CTRL	
4	CTRL	
5	CTRL	
6	CTRL	SPARE
7	CTRL	
8	CTRL	
9	CTRL	
10	CTRL	

AMX NXC-REL10
RELAY CARD

1	CTRL	AV7.12 MIC PANEL STAT LED
2	CTRL	AV7.12 MIC PANEL STAT LED
3	CTRL	AV7.12 MIC PANEL STAT LED
4	CTRL	AV7.12 MIC PANEL STAT LED
5	CTRL	AV7.12 MIC PANEL STAT LED
6	CTRL	AV7.12 MIC PANEL STAT LED
7	CTRL	AV7.12 MIC PANEL STAT LED
8	CTRL	AV7.12 MIC PANEL STAT LED
9	CTRL	AV7.12 MIC PANEL STAT LED
10	CTRL	AV7.12 MIC PANEL STAT LED

AMX NXC-REL10
RELAY CARD

1	CTRL	AV7.12 MIC PANEL STAT LED
2	CTRL	
3	CTRL	
4	CTRL	
5	CTRL	
6	CTRL	SPARE
7	CTRL	
8	CTRL	
9	CTRL	
10	CTRL	

ROOM A

ROOM A CONTROL.
AS BUILT DRAWINGS OF CURRENT SYSTEM NOT AVAILABLE AT TIME OF THIS DESIGN

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DEC100167		NONE

engineer
S. COE

drawn | created
EDC | OCTOBER 05, 2012

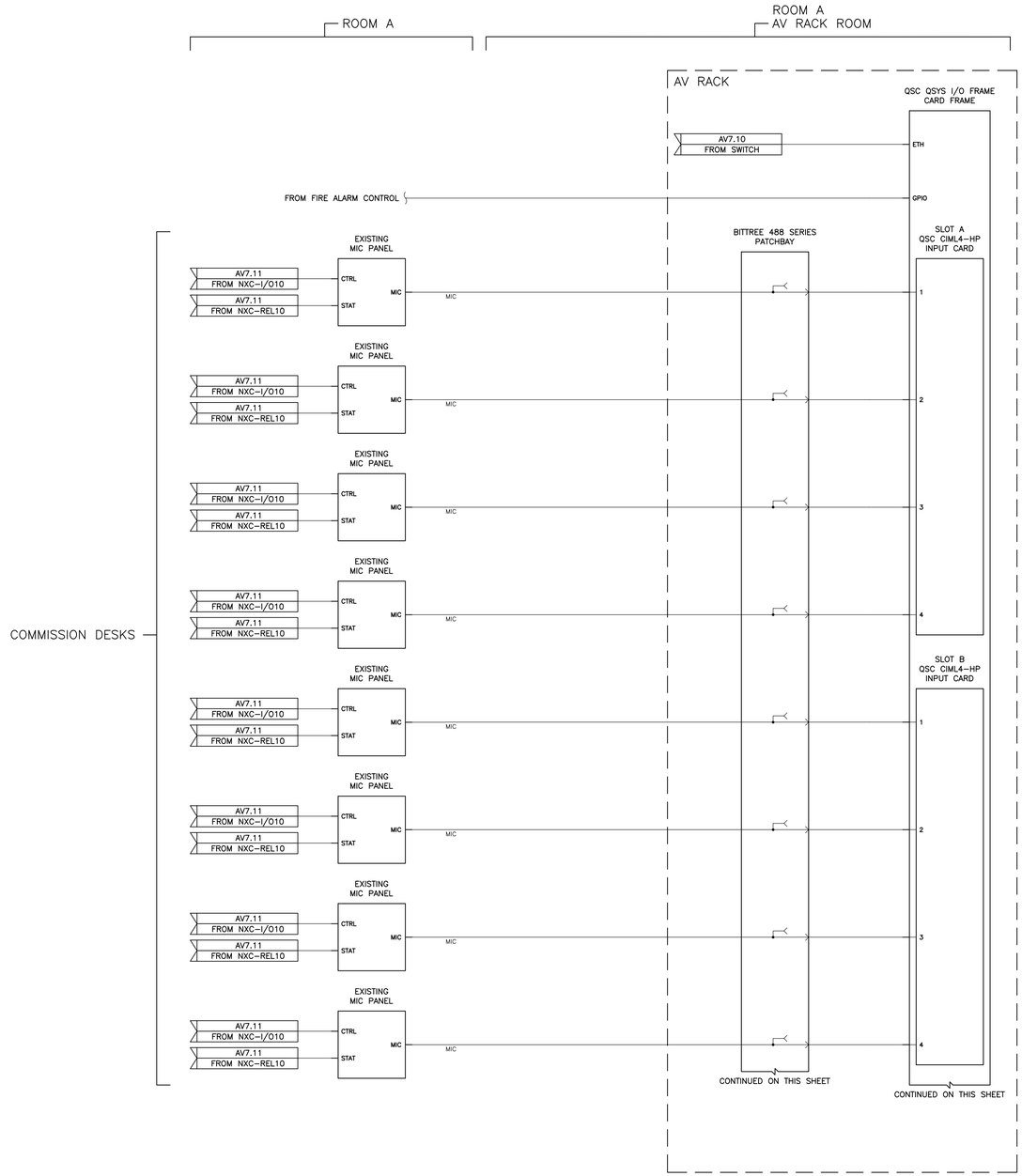
area/attraction

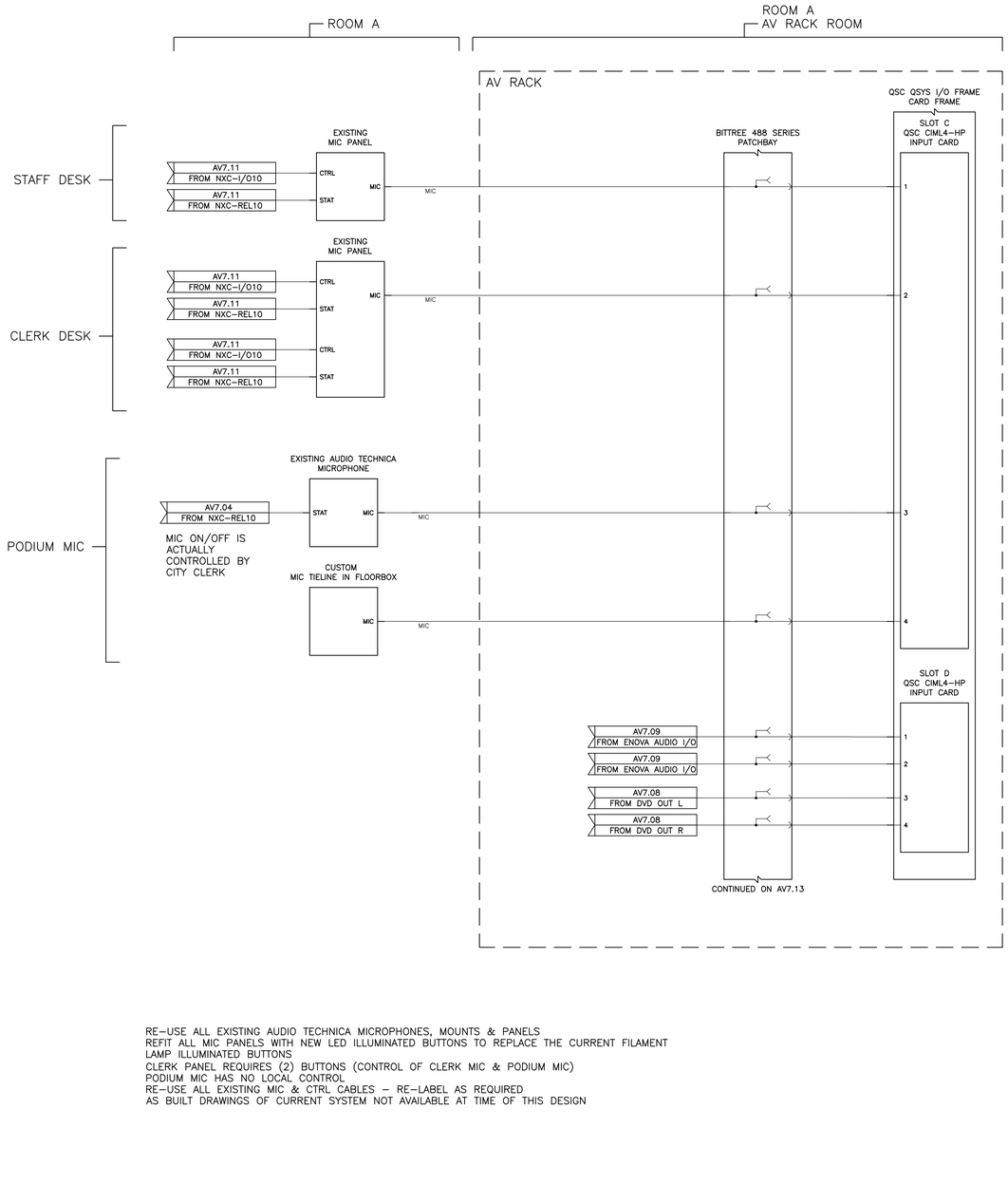
OVERALL

project
TELEVISION PRODUCTION
AVC SYSTEMS UPGRADE

title
AV SINGLE LINE
BLOCK DIAGRAM

sheet no. | rev
AV7.11 |





RE-USE ALL EXISTING AUDIO TECHNICA MICROPHONES, MOUNTS & PANELS
REFIT ALL MIC PANELS WITH NEW LED ILLUMINATED BUTTONS TO REPLACE THE CURRENT FILAMENT LAMP ILLUMINATED BUTTONS
CLERK PANEL REQUIRES (2) BUTTONS (CONTROL OF CLERK MIC & PODIUM MIC)
PODIUM MIC HAS NO LOCAL CONTROL
RE-USE ALL EXISTING MIC & CTRL CABLES – RE-LABEL AS REQUIRED
AS BUILT DRAWINGS OF CURRENT SYSTEM NOT AVAILABLE AT TIME OF THIS DESIGN

ROOM A AUDIO.
AS BUILT DRAWINGS OF CURRENT SYSTEM NOT AVAILABLE AT TIME OF THIS DESIGN

DESIGN INTENT
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CITY HALL
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date
OCT 15, 2012
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REVISIONS

rev	date	description

project no.	cad file	scale
DEC100167		NONE

engineer
S. COE
drawn | created
EDC | OCTOBER 05, 2012
area/attraction

OVERALL

project
TELEVISION PRODUCTION
AVC SYSTEMS UPGRADE

title
AV SINGLE LINE
BLOCK DIAGRAM

sheet no. | rev
AV7.12 |

ROOM A

ROOM A
AV RACK ROOM

ROOM A

AV RACK

QSC QSYS I/O FRAME
CARD FRAME

AV7.10
FROM SWITCH

ETH

RE-USE CURRENT LISTEN TECHNOLOGIES
LT-800 ASSISTED LISTENING SYSTEM (ALS)

BITTREE 488 SERIES
PATCHBAY

TBD
EXISTING ALS TRANSMITTER

AUDIO IN
ANT
RF

TBD EXISTING
ALS ANTENNA

SLOT A
QSC COL4
OUTPUT CARD

1 AUDIO
2 AUDIO
3 AUDIO
4 AUDIO

AV7.09
TO ENOVA AUDIO I/O

AV7.09
TO ENOVA AUDIO I/O

AUDIO OUT FOR OFE DVD
RECORDER. NOTE THAT
DEFAULT VIDEO INPUT
FOR DVD RECORDER IS
EXISTING HOUSE CAMERA
VIA DIRECT CABLE.

STAFF DESK

LAND SPARE OUTPUTS TO EXISTING
PATCHBAYS

SLOT B
QSC COL4
OUTPUT CARD

1 AUDIO
2 AUDIO
3 AUDIO
4 AUDIO

AV7.09
TO GRANICUS ENCODER

AV7.09
TO GRANICUS ENCODER

CONTINUED ON THIS SHEET

QSC CX204V
AMPLIFIER

SLOT C
QSC CODP4
DATAPORT CARD

DP1 DATAPORT
DP2 DATAPORT

DP1
DP2

1 SPKR
2 SPKR
3 SPKR
4 SPKR

QSC CX-204V AMPLIFER SHOWN AS
PLACEHOLDER. EXISITING SPEAKER
CONNECTIONS UNKNOWN AT THIS TIME.
ADJUST AMPLIFIER MODEL TO SUIT AFTER
SITE SURVEY. AMPLIFIER SHALL BE QSC CX
SERIES WITH DATAPORT.

(8) EXISTING SPEAKERS LOCATIONS
CIRCUITING UNKNOWN

QSC AD-C152ST
CEILING SPEAKER

QSC AD-C152ST
CEILING SPEAKER

QSC AD-C152ST
CEILING SPEAKER

QSC AD-C152ST
CEILING SPEAKER

QSC AD-C152ST
CEILING SPEAKER

QSC AD-C152ST
CEILING SPEAKER

QSC AD-C152ST
CEILING SPEAKER

QSC AD-C152ST
CEILING SPEAKER

CEILING

EXISITING CEILING SPEAKERS TO BE
REPLACED - QSC AD-C152ST
RECOMMENDED, BUT AV CONTRACTOR TO
VERIFY WHETHER SPACE AVAILABLE - IF NOT
THEN PROPOSE ALTERNATE SPEAKER MODEL.

REPLACE CURRENT
SENNHEISER WIRELESS MIC
RECEIVERS

SHURE UR4D+
WIRELESS MIC RECEIVER

BITTREE 488 SERIES
PATCHBAY

SLOT D
QSC CIML4-HP
INPUT CARD

SHURE
ANTENNA

SHURE
ANTENNA

AV7.10
FROM SWITCH

ETH
A
B
1 AUDIO
2 AUDIO

1
2

GEFEN GTV-DD-2-AA
DIGITAL AUDIO DECODER

AV7.08
FROM APPLE TV

TOSLINK
OUT L AUDIO
OUT R AUDIO

3
4

COUNCIL CHAMBER AUDIO

DESIGN INTENT
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BEVERLY HILLS
CITY HALL
455 N. REXFORD DRIVE
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ELECTROSONIC
DESIGN CONSULTING

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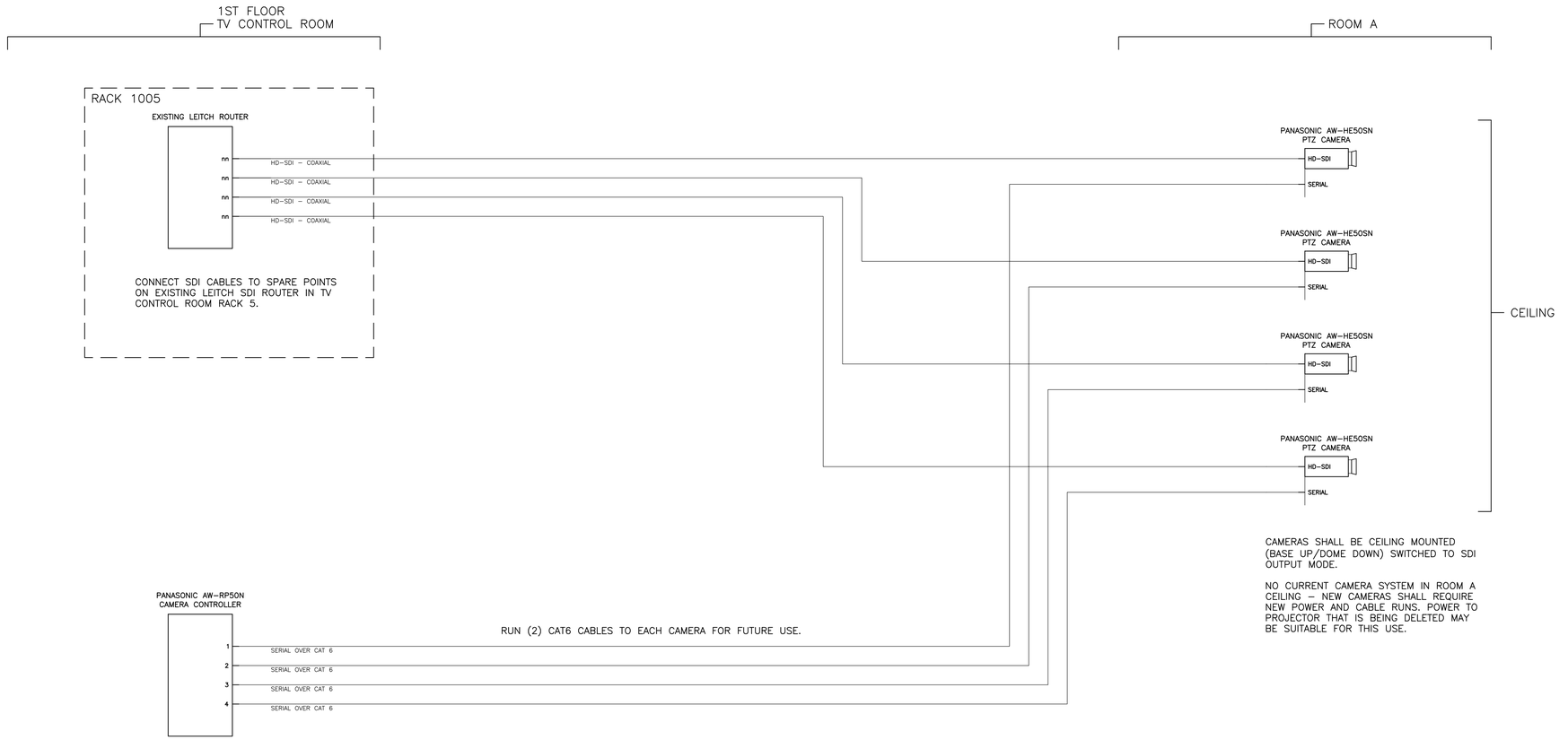
project no. DEC100167 | cad file | scale NONE
engineer
S. COE
drawn EDC | created OCTOBER 05, 2012
area/attraction
OVERALL
project
TELEVISION PRODUCTION
AVC SYSTEMS UPGRADE
title
AV SINGLE LINE
BLOCK DIAGRAM
sheet no. AV7.13 | rev



BEVERLY HILLS CITY HALL TV CONTROL ROOM NOTE:

THE CURRENT TV SYSTEM IN CONTROL ROOM IS A FULLY FUNCTIONING TV BROADCAST SYSTEM. THIS UPGRADE PROJECT INCLUDES ADDING NEW EQUIPMENT TO THE SYSTEM AS SHOWN ON THIS AND THE FOLLOWING DRAWING SHEETS. THE AV CONTRACTOR IS ENTIRELY RESPONSIBLE & LIABLE FOR ENSURING THAT NO CURRENT FUNCTIONALITY IS INTERRUPTED OR DAMAGED. NEW AV EQUIPMENT BEING ADDED TO THE SYSTEM SHALL BE TESTED AND PROVEN BY THE AV CONTRACTOR FROM INITIAL POINT OF CONNECTION ALL THE WAY THROUGH THE EXISTING BROADCAST SIGNAL CHAIN DEVICES TO THE FINAL BROADCAST OUTPUT FEED POINT. ANY EXTRA PROGRAMMING OR ADJUSTMENT OF EXISTING BROADCAST EQUIPMENT IN ORDER TO INTEGRATE THE FUNCTIONALITY OF THE NEW EQUIPMENT IS SOLELY THE RESPONSIBILITY OF THE AV CONTRACTOR.

ROOM A CAMERAS

DESIGN INTENT
NOT FOR CONSTRUCTION

client

BEVERLY HILLS
CITY HALL
455 N. REXFORD DRIVE
BEVERLY HILLS, CA 90210

ELECTROSONIC
DESIGN CONSULTING

ISSUE

description
DESIGN INTENT

date
OCT 15, 2012

approved

REVISIONS

rev	date	description

project no.	cad file	scale
DEC100167		NONE

engineer
S. COE

drawn | created
EDC | OCTOBER 05, 2012

area/attraction
OVERALL

project
TELEVISION PRODUCTION
AVC SYSTEMS UPGRADE

title
AV SINGLE LINE
BLOCK DIAGRAM

sheet no. | rev
AV7.14 |

CONTROL ROOM RACKS

EXTREME NETWORKS X450E
GBIT SWITCH

CAT6A — AV7.03 FROM CHAMBER SWITCH

CAT6A — AV7.10 FROM ROOM A SWITCH

AMX NI-700
CONTROLLER
ETH — AXLINK — AXLINK

AMX AXB-MIDI
MIDI INTERFACE
AXLINK — MIDI OUT — MIDI (A)

CAT6A

CAT6A

CAT6A

CONTINUED ON NEXT SHEET

CONNECT AN OFE PC, WITH DISPLAY/MOUSE/KEYBOARD TO THIS NETWORK FOR SYSTEM PROGRAMMING AND MAINTENANCE.

NEW AV NETWORK SWITCHES MAY REQUIRE LINK TO CITY HALL IT NETWORK. LIAISE WITH CITY HALL STAFF TO DETERMINE ANY IP ADDRESSING RESTRICTIONS.

PROVIDE ALL NEW AMX PROGRAMMING TO INCLUDE QSYS AND AMX DXLINK SYSTEM OVERVIEWS, MIC CHANNEL ADJUSTMENT PAGES, AUDIO/VIDEO ROUTING MATRIX PAGES, AMPLIFIER MONITORING, YAMAHA CONSOLE SNAPSHOT RECALLS ETC.

AMX MXT-1900L-PAN
19.4" PANORAMIC TOUCH SCREEN
ETH

QSC QSYS CORE 500i
DSP HEAD END
ETH

SLOT A
QSC CIML4-HP
INPUT CARD
1 — AV7.16 FROM ENOVA AUDIO I/O
2 — AV7.16 FROM ENOVA AUDIO I/O
3 — EXISTING PATCH BAYS
4 — EXISTING PATCH BAYS

SLOT A
QSC CIML4-HP
INPUT CARD
1
2
3
4

SLOT B
QSC COL4
OUTPUT CARD
1 — AUDIO — AV7.16 FROM ENOVA
2 — AUDIO — AV7.16 FROM ENOVA
3 — AUDIO — AV7.16 TO GRANICUS ENCODER
4 — AUDIO — AV7.16 TO GRANICUS ENCODER

CONNECT EXISTING TELEPHONE CALL IN SYSTEM AUDIO TO QSYS DSP INPUT/OUTPUT CHANNELS AS REQUIRED

SLOT B
QSC COL4
OUTPUT CARD
1 — AUDIO — EXISTING PATCH BAYS
2 — AUDIO
3 — AUDIO
4 — AUDIO

CONTINUED ON THIS SHEET

QSC QSYS CORE 500i
DSP HEAD END

SLOT E
QSC CAES4
OUTPUT CARD
1 — AES AUDIO
2 — AES AUDIO
3 — AES AUDIO
4 — AES AUDIO

SLOT F
QSC CAES4
OUTPUT CARD
1 — AES AUDIO
2 — AES AUDIO
3 — AES AUDIO
4 — AES AUDIO

SLOT G
QSC CAES4
OUTPUT CARD
1 — AES AUDIO
2 — AES AUDIO
3 — AES AUDIO
4 — AES AUDIO

SLOT H
QSC CAES4
OUTPUT CARD
1 — AES AUDIO
2 — AES AUDIO
3 — AES AUDIO
4 — AES AUDIO

ADD NEW AES CONNECTIONS BETWEEN QSYS AND YAMAHA CONSOLE

REMOVE CURRENT MACKIE CONSOLE – PROVIDE NEW YAMAHA 01V96i WITH 16 CHANNEL AES MINI YGDAI CARD IN OPTION SLOT

YAMAHA 01V96i
AUDIO CONSOLE
(A) — MIDI IN

ANALOG INPUTS/OUTPUTS FROM PATCHBAY

RECONNECT YAMAHA ANALOG INPUTS/OUTPUTS TO EXISTING PATCHBAY AS PER CURRENT MACKIE CONSOLE SETUP

SLOT A
YAMAHA MY16-AE
AES CARD
AES 1-16

CONTROL ROOM DESK

CONTROL ROOM.

DISCUSS SUITABLE LOCATIONS IN CONTROL ROOM RACKS FOR NEW EQUIPMENT WITH OWNER

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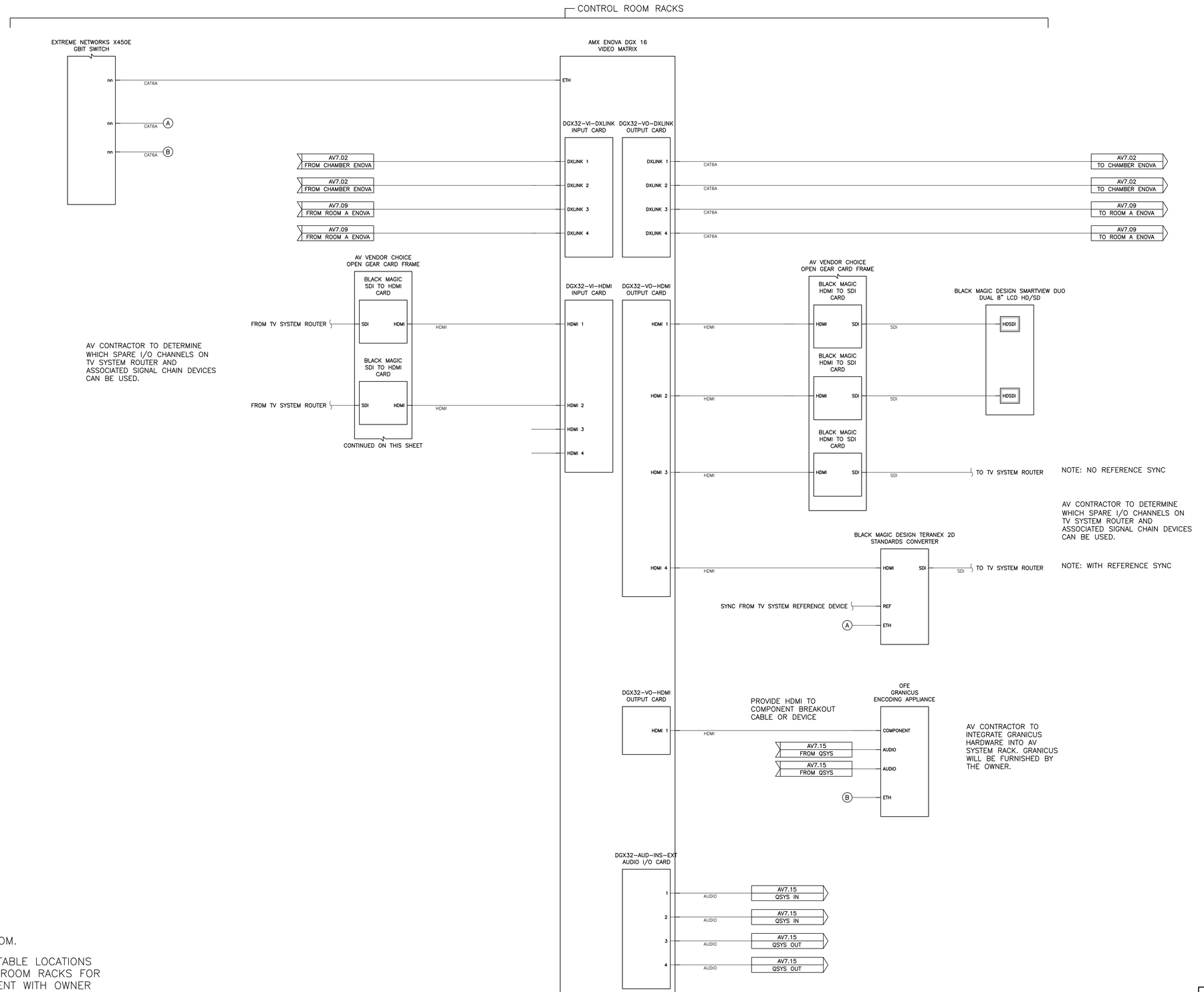

CONTROL ROOM.

DISCUSS SUITABLE LOCATIONS IN CONTROL ROOM RACKS FOR NEW EQUIPMENT WITH OWNER

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TELEVISION PRODUCTION
AVC SYSTEMS UPGRADE
title
AV SINGLE LINE
BLOCK DIAGRAM
sheet no. AV7.16 | rev

ELECTROSONIC

Beverly Hills City Hall Television Production AVC Systems Upgrade

AVC Systems

BHCH TV Production –AVC Equipment List Oct 15, 2012 - Major Components

Manufacturer	Model	Description	Qty
1 - Council Chambers			
AMX	Enova DGX 16	Digital Media Matrix 16x16 Switcher	1
AMX	Enova DGX32-VI-DXLINK	Enova DGX DXLink Twisted Pair Input Board	2
AMX	Enova DGX32-VO-DXLINK	Enova DGX DXLink Twisted Pair Output Board	2
AMX	AVB-TX-MULTI-DXLINK	DXLink Multi-Format Transmitter Module	1
AMX	AVB-RX-DXLINK-HDMI	DXLink HDMI Receiver Module	6
AMX	AVB-WP-TX-MULTI-DXLINK-BL	DXLink Multi-Format Wallplate Transmitters	3
AMX	MXD-1000	10.1" Modero X Series Wall/Flush Mount Touch Panel	1
AMX	MXT-1000	10.1" Modero X Series Tabletop Touch Panel	1
AMX	AVB-VSTYLE-SURFACE-MNT	V Style Single Module Surface Mount Brackets	8
AMX	Enova DGX32-VI-HDMI	Enova DGX HDMI Input Board	1
AMX	CC-HD15M-RCA3M	HD15 Male to Breakout RCA connectors (loose equipment)	3
AMX	NXF-Mini	NetLinx Mini CardFrame, ICSNet Interface with four (4) NetLinx Card Slots	1
AMX	NXC-REL10	Relay Card, 10 Channels	2
AMX	NXC-I/O10	Input/Output Card, 10 Channels	2
AMX	AVS-ENOVADGX32-AUD-INS-EXT	Enova DGX Audio Insert/Extract Board	1
AMX	PSN6.5	Power Supply	1
Apple	Apple TV	Apple TV - 1080P model	1
Audio Technica	U857QL	Cardioid Condenser Goosneck Microphone, 18.94"	13
Audio Technica	AT 8416	Microphone Shock Mount	12
Audio Technica	AT8666	Microphone Desk Stand	1
Denon	DBP-2012UDCIP	Blu-Ray DVD/CD player with RS232	1
Extreme Networks	X450e-24p	24 Port 10/100/1000 Managed Ethernet Switch + 4 SFP ports	1
Extreme Networks	Altitude 4511	Wireless Access Point	1
Gefen	GTB-HDFST-148-BLK	1 to 8 HDMI Splitter w/ Mono-LOK HDMI	1
Gefen	Mono-LOK HDMI	Mono-LOK HDMI cables - 1 lot as required	1
Gefen	GTB-HDFST-144-BLK	1 to 4 HDMI Splitter w/ Mono-LOK HDMI	3
Gefen	GTV-COMPSVID-2-HDMIS	Composite to HDMI Scaler	1
Gefen	GTV-HDMI-2-COMPSVIDS	HDMI to Composite Scaler	1
Gefen	GTV-DD-2-AA	Digital Audio Decoder	1
Miscellaneous	Hardware	Allowance for cables/connectors	1
QSC	CX302	2-Channel Amplifier, 200 watts/ch at 8Ω	1
QSC	I/O FRAME	I/O Frame for Input/Output cards	3
QSC	CIML4-HP	High-Performance Mic/Line Input Card	7
QSC	COL4	Line Output Card	2
QSC	CODP4	DataPort Output Card	2
QSC	IT-42	Isolation Transformer – 25V, 70V , and 100V dual output transformer for CX302	1
Samsung	ME65B	65" LED-LCD Display	2
Samsung	S19B420M	18.5" widescreen LED-LCD w/audio	14
Shure	UR4D+-H4	Dual Channel Diversity Wireless microphone receiver	1
Shure	UR2/BETA58-H4	Handheld Microphone transmitter with Beta 58 Head	2

Manufacturer	Model	Description	Qty
2 - Room A			
AMX	Enova DGX 16	Digital Media Matrix 16x16 Switcher	1
AMX	Enova DGX32-VI-DXLINK	Enova DGX DXLink Twisted Pair Input Board	2
AMX	Enova DGX32-VO-DXLINK	Enova DGX DXLink Twisted Pair Output Board	2
AMX	AVB-TX-MULTI-DXLINK	DXLink Multi-Format Transmitter Module	1
AMX	AVB-RX-DXLINK-HDMI	DXLink HDMI Receiver Module	4
AMX	AVB-WP-TX-MULTI-DXLINK-BL	DXLink Multi-Format Wallplate Transmitters	3
AMX	MXD-1000	10.1" Modero X Series Wall/Flush Mount Touch Panel	1
AMX	MXT-1000	10.1" Modero X Series Tabletop Touch Panel	1
AMX	AVB-VSTYLE-SURFACE-MNT	V Style Single Module Surface Mount Brackets	5
AMX	Enova DGX32-VI-HDMI	Enova DGX HDMI Input Board	1
AMX	CC-HD15M-RCA3M	HD15 Male to Breakout RCA connectors (loose equipment)	3
AMX	NXF-Mini	NetLinx Mini CardFrame, ICSNet Interface with four (4) NetLinx Card Slots	1
AMX	NXC-REL10	Relay Card, 10 Channels	2
AMX	NXC-I/O10	Input/Output Card, 10 Channels	2
AMX	AVS-ENOVADGX32-AUD-INS-EXT	Enova DGX Audio Insert/Extract Board	1
AMX	NI-2100	Netlinx Controller	1
AMX	PSN4.4	Power Supply	2
AMX	Enova DGX32-VO-HDMI	Enova DGX HDMI Output Board	1
Apple	Apple TV	Apple TV - 1080P model	1
AV Vendor Choice	12vdc LED Button	12vdc momentary LED Illuminated panel mount push button for mic panels	11
AV Vendor Choice	Wall Mount	Wall Mount for 55" LCD	3
Bittree	488 SERIES	2x24 1RU, Programmable Audio Patch Bay 1/4" Jack	1
Denon	DBP-2012UDCIP	Blu-Ray DVD/CD player with RS232	1
Extreme Networks	X450e-24p	24 Port 10/100/1000 Managed Ethernet Switch + 4 SFP ports	1
Extreme Networks	Altitude 4511	Wireless Access Point	1
Gefen	GTV-COMPSVID-2-HDMIS	Composite to HDMI Scaler	1
Middle Atlantic	MRK-4436	44 Space-Full Rack Assembly w/ 10" Fan Top	1
Miscellaneous	Hardware	Allowance for cables/connectors	1
Panasonic	AW-HE50SN	HD/SD Pan/Tilt Camera	4
Panasonic	AW-RP50N	Camera Controller	1
QSC	CX302V	2-Channel Amplifier, 250 watts/ch at 70V	1
QSC	I/O FRAME	I/O Frame for Input/Output cards	2
QSC	CIML4-HP	High-Performance Mic/Line Input Card	4
QSC	COL4	Line Output Card	4
QSC	CODP4	DataPort Output Card	1
QSC	AD-CI52ST (70V)	Shallow Ceiling Mount 5.25" 2-way Speaker (70V: 30, 15, 7.5, 3.8W)	8
Samsung	ME55B	55" LED-LCD Display	3
Shure	UR4D+-H4	Dual Channel Diversity Wireless microphone receiver	1
Shure	UR2/BETA58-H4	Handheld Microphone transmitter with Beta 58 Head	2
Smart Tech	Podium 500 Series	SMART Podium 500 series interactive pen display	1
3 - TV Control Room			
AMX	Enova DGX 16	Digital Media Matrix 16x16 Switcher	1
AMX	Enova DGX32-VI-DXLINK	Enova DGX DXLink Twisted Pair Input Board	1
AMX	Enova DGX32-VO-DXLINK	Enova DGX DXLink Twisted Pair Output Board	1
AMX	Enova DGX32-VI-HDMI	Enova DGX HDMI Input Board	1
AMX	PSN 2.8	Power Supply	1
AMX	AVS-ENOVADGX32-AUD-INS-EXT	Enova DGX Audio Insert/Extract Board	1

Manufacturer	Model	Description	Qty
AMX	MXT-1900L-PAN	19.4" Panoramic Tabletop Touch Panel	1
AMX	NI-700	Netlinx Controller	1
AMX	AXB-MIDI	Axlink MIDI Interface.	1
AMX	AC-RK	Accessory Rack Kit holds up to three NetLinx modules and measures only one rack unit in height	1
AMX	Enova DGX32-VO-HDMI	Enova DGX HDMI Output Board	2
AV Vendor Choice	Open Gear Card frame	Card frame for Open Gear Converter cards	1
Black Magic Design	Teranex 2D Processor	Video Standards Converter/Processor	1
Black Magic Design	Open Gear SDI to HDMI	Open Gear SDI to HDMI card	2
Black Magic Design	Open Gear HDMI to SDI	Open Gear HDMI to SDII card	3
Black Magic Design	Smart View Duo	Dual 8.4" rackmount LCD w/ DVI	1
Extreme Networks	X450e-24p	24 Port 10/100/1000 Managed Ethernet Switch + 4 SFP ports	1
Miscellaneous	Hardware	Allowance for cables/connectors	1
QSC	CORE 500i	Digital Signal Processor	1
QSC	CIML4-HP	High-Performance Mic/Line Input Card	2
QSC	COL4	Line Output Card	2
QSC	CAES4	AES-3 Input/Output Card	4
Yamaha	01V96i	16 Channel Digital Mixing Console	1
Yamaha	MY16-AE	Mini-YGDAI Card - 16 in / 16 out AES/EBU interface card	1